CENTRAL PLANNING

by Jan Tinbergen

NEW HAVEN AND LONDON
YALE UNIVERSITY PRESS
1964

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Library of Congress catalog card number: 64–20938

PREFACE

The scope and organization of this book will be explained in the text. I want to express here my sincere thanks to the many persons and institutions who collaborated in the preparation of the book. Among these I want to mention in particular Mrs. L. Kahlmann, who took charge of the analysis of responses to the inquiry made of numerous official planning agencies in countries of all types, and Mr. H. Linnemann, who commented on the general text. Sincere appreciation is also due to the officials who were kind enough to answer the long list of questions, not always fitting the particular situation in their country. I also thank Mrs. S. van Willigenburg for having typed the manuscript. All of us are very grateful for the opportunity given us by Professor L. G. Reynolds and the Yale University Press to publish this volume in their series.

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FOREWORD

Modern economics has been bred chiefly in Western Europe and the United States, and despite its aspiration toward generality it bears the stamp of institutions and issues characteristic of these areas.

But the economic world no longer revolves about London and New York. Dozens of new nations are struggling toward economic independence and industrial growth under institutional arrangements quite unlike those of the West. Economies of a novel type also extend eastward from central Europe to the Bering Strait and have been busily developing their own principles as a by-product of administrative experience. It is asserted that "Western economics" has only limited analytical value in these other countries.

The problem of the content and relevance of economics thus arises inescapably. Are the economic principles taught in the West really susceptible of general application? Or are they culture-bound and relevant mainly to industrial capitalist countries? Is it possible to create a general economics which would be as useful in Poland or India as in Canada or France? Or must we be content with several species of economics which will remain distinct in intellectual content and applicability?

"Comparative economics" has been regarded as a separate area of the economics curriculum, consisting of a botanical classification of national economies into a few loosely labeled boxes. But surely any course in economics is potentially comparative. A concern with comparative experience can profitably be infused into any of the standard branches of economic study. This series is inspired by the hope that a rethinking of particular branches of economics in world perspective, combined with a bibliography of available material from many countries, may help teachers to give their courses a broader and more comparative orientation.

In pursuing this objective, we deliberately chose autonomy over standardization. Each author was left free to determine his own approach and method of treatment. The essays thus differ considerably in length, analytical as against descriptive emphasis, geographical coverage, and other respects. How far the original intent of the series has been accomplished is for the profession to judge.

We are grateful to the authors who have struggled with possibly insoluble problems, to the Ford Foundation for its support of the enterprise, and to the staff of the Yale University Press for their helpful cooperation.

The Inter-University Committee on Comparative Economics: Abram Bergson, Arthur R. Burns, Kermit Gordon, Richard Musgrave, William Nicholls, Lloyd Reynolds (Chairman)

1 ECONOMIC PLANNING AS PART OF THE ECONOMIC PROCESS: ACTORS, TASK, AND ELEMENTS

NATURE OF THIS STUDY; ORIGIN OF PLANNING

This study deals with the process of *central economic planning,* or economic planning by governments. It aims at a threefold treatment, which may be summarized as follows: (a) to describe the process of central planning, considered as one of the service industries of a modern economy; (b) to analyze its impact on the general economic process; (c) to indicate, as far as possible, the optimal extent and techniques of central planning.

This means that, under (a), central economic planning will be made the object of traditional economic analysis. It will be described and analyzed like any other element of the economic process: its product and factors will be defined, its possible methods of production set out, as well as the possibilities to increase its efficiency in the narrower sense.

Under (b) its contribution to well-being will be estimated, in order to enable us to appraise its usefulness, if any, under varying circumstances. This refers to its efficiency in a more general sense.

As for (c) two approaches are possible, namely the approach of business economics and that of welfare economics. These approaches may be called "normative" in that they try to find out how a certain optimum, seen as a goal, can be obtained by proper choices of the "action parameters" at the disposal of the agencies concerned. Business economics approaches the subject from the perspective of the enterprise; welfare economics from the viewpoint of a nation, or a group of nations.

Subject (a) will be dealt with in Chapter 1; subject (b) in Chapters 2 and 3; and subject (c) in Chapter 4.

The terminology used in this book will be partly the usual terminology of economics, partly the terminology developed elsewhere[1] by the author for the subject of economic policy and, finally, some will be coined for the special purposes of this study. The remainder of this chapter will introduce the latter part of our terminology by giving a descriptive analysis of the characteristic elements of a process of central economic planning.

The historical origin of the planning techniques applied today clearly springs from two main sources: Russian communist planning and Western macroplanning. Russian planning was designed to guide in detail the production processes of a whole country, taking advantage of a completely publicly owned productive apparatus. This program was based on a general background of Marxian ideas, which forecast that enterprises would become larger and larger and that finally the community would take them over and operate them as one big enterprise. There did not exist, however, at the time the Bolsheviki took over, any elaborate system of planning and it had to be built up on the basis of subsequent practical experience, with some influence exerted by war planning in the First World War, particularly in Germany. Military elements played a considerable role because of the similarity in structure between an army organization and a planned economy in the communist sense. Technical elements also played an important role, as they do in any big enterprise, and more or less as a consequence of the desire to intervene in many details of economic life.

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[1] Cf. J. Tinbergen, *Economic Policy: Principles and Design* (Amsterdam, 1956).

Western macroeconomic planning had a very different origin, namely the desire to understand the operation of the economy as a whole. It was highly influenced by the statistical concepts relevant to national or social accounts and by Keynesian concepts, combined with market analysis, which later developed into macroeconomic econometric models. There was still a basic belief that many detailed decisions could and should be left to the decentralized system of single enterprises and that guidance by the government might confine itself to indirect intervention with the help of a few instruments only. War experiences with rationing allocation, permits, and so on did have some influence but the concern was always to intervene directly only in sensitive markets.

Recently influences have been at work to bring the two systems somewhat closer together. The Russians have gone through a number of experiences which have led them to accept the common denominator of money, hence to think somewhat more in macroterms and to accept some decentralization. Westerners have been influenced by the more detailed research methods involved in input-output analysis and the possibilities created by better statistics and better computing machines. Westerners have also increasingly been interested in planning the development of low-income countries. In a general way, moreover, both Westerners and Russians (and planners from other communist-ruled countries) have studied each other's experiences and been impressed by some of them.

ACTORS AND TASK OF PLANNING

The word "actors" has been proposed by the author as an expression synonymous to "transactors" as used in national accounting. "Actor" seems to be more appropriate since transactions are not the only actions playing a role in an economy. It covers both the institutions or agencies and the physical persons involved in the planning process. Throughout this book the phrase Central Planning Bureau (CPB) will be used to indicate the agency directly responsible for the process, though not necessarily the only one involved. In many countries such an agency exists, but under very different names.

The CPB will use as a rule a large number of "inputs"—mostly of the "information" type—produced by other institutions, which therefore can be considered as co-producers of the final output, indicated as a *Plan*. This document, to be handed over to the government of the country concerned, consists of a set of coherent figures projecting the most desirable development of the economy during some future period. Dependent on the length of this period we speak of short-term or long-term plans. Usually the former refers to one year, the latter to a longer period, ranging from five years up to 25 years. Plans of this type are not the only products of a CPB; there are a number of by-products, bearing on specific sectors of the economy, specific measures envisaged by the government, or the preparation of future work.

Thus, the Netherlands CPB cooperates with other government agencies in the drafting of documents on the building sector, on exports and imports, on the state budget, on industrialization policies, and so on. Such documents are prepared either for Parliament or for international meetings such as the ones called by the Organization for European Economic Cooperation (OEEC), now the Organization for Economic Cooperation and Development (OECD).

A considerable portion of the activities of the Netherlands CPB is devoted to work for the Social-Economic Council, a tripartite advisory body on economic and social policy with considerable influence on government decisions. Among activities of this type may be mentioned an analysis of the probable consequences of the introduction of new items of social insurance.

Activities meant as a preparation for future work may be research on production functions or econometric models, as undertaken on various occasions by the Dutch planning bureau. Another example was the preparation of a survey of the estimated costs of a number of measures of a social or cultural character, recommended by various nongovernmental organizations, to be proposed in the future by some of the political parties. Auxiliary activities have also been preparatory studies for a future education plan, or proposals for another classification (according to economic principles rather than traditional administrative rules) of budget items. Examples of these various types of by-products of planning will be found in the work program of any CPB.

The products of a CPB are essentially recommendations to the government. The government may accept the plan or other advice as a basis for action; at that stage it will acquire a legal status as official policy. This status it does not necessarily yet have, however, when leaving the CPB. Even if a long-term plan has been accepted by the government, there is a considerable probability that final action on a particular subject will deviate from what was proposed. As a consequence of the discovery of new facts there will usually be good reasons for revising a plan before it is carried out. This is why short-term plans, made shortly before action must be taken, are likely to correspond more closely to such action than are long-term plans.

It is possible and useful to distinguish between a number of elements of the planning process; everything that helps to determine the process will be called an element of it, and will be described in the subsequent sections. Each may vary as to content and a number of choices can therefore be made with regard to these elements, comparable to the choice of technology in a production process. The process and its elements naturally depend on the purpose or the *task*. This task must be known more precisely before choices can be made.

Perhaps the most characteristic features of the task of planning are the following three:

(a) A plan refers to the future, i.e. it requires looking ahead.
(b) It is based on a number of aims, which have to be specified in order to carry out the planning process.
(c) It requires a coordination of the means of economic policy to be used in order to reach the aims.

From this enumeration it will be clear that there always is an element of prediction or forecasting involved and that the CPB must handle techniques of forecasting. The aims of economic policy can originate from government, from parliament, or even directly from the electorate; here the responsibility of a CPB can be only to give more specific content to these aims or to make them more explicit. Government and its organs will often be indicated in our context as *policy makers,* and this phrase applies to both international policy and domestic policy.

Also the possible limitations—if any—on the use of means of policy must, in principle, be chosen by the policy makers. Here the role of a CPB is to investigate the probable effects of the use of the various means of policy; in all probability the results of such investigations will influence the policy makers' choice to a considerable extent.

ACTIVITIES INVOLVED IN PLANNING

By the word "activities" the work to be performed by the CPB will be indicated. The nature of this work is to a considerable extent scientific, although essentially of an applied character. We will illustrate it by giving two examples, the first referring to a macroeconomic short-term *plan of adjustment* of the economy and the second to a microeconomic long-term *development plan.* In the former the following phases may conveniently be distinguished:

(1) First, a *forecast* about the economic situation must be made. By forecast we mean an estimate of the future economic situation under the assumption that there will be no change in economic policy. Clearly any forecast must always be based on a large number of assumptions, both about the operation of the economy and about the probable course of the so-called "data" or external or exogenous variables. Everybody making a forecast chooses these assumptions as realistically as possible, but even so forecasts will as a rule not coincide with the actual course of events. There does not seem to be any reason therefore to make a distinction between forecasts and so-called projections.

(2) The second phase of the activities of a CPB must consist of a comparison of the forecast with the *aims* of economic policy. It may be that this comparison suggests the impossibility of reaching the aims originally set and therefore leads to their modification. As a rule, however, a more definite con-

clusion as to the feasibility of the aims proposed can only be reached in the third phase.

(3) The third phase consists of an estimation of the *changes in the means* of policy needed to meet the aims. This is the most important phase of planning, since it adds most to our knowledge about the operation of the economy and hence to our understanding of the possibilities of the policies considered, the means used or in reserve, and their relative attractiveness. In fact, the choice of means to be used should depend as little as possible on preconceived ideas and as much as possible on the analysis of their probable results.

A few examples may illustrate the activities of phases (2) and (3). The aims of a government's economic policy may be:[2]

(a) A given level of employment, say 97 per cent of the active population working under a labor contract.
(b) A given level of investment, say 20 per cent of national product, so as to ensure a sufficient rate of growth of national product.
(c) Balance of payments equilibrium.
(d) A given distribution of national income between the main groups of the population, to the effect, say, that the average worker earns 70 per cent of the average national income per head of the active population.

Some of these figures may be minimum levels rather than fixed levels. There may be additional aims, e.g. with regard to the average price rise, or the distribution of employment or income between regions.

The forecast made in phase (1) may now have shown that the most probable situation to be expected without a change in policy will be characterized by:

(i) A level of employment of 96.5 per cent only.

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[2] This example represents a simplified illustration of the situation in the Netherlands during the first decade after World War II.

(ii) A level of investment of 18 per cent only.

(iii) A balance of payments surplus of 10 per cent of exports.

(iv) A distribution of income characterized by a worker's income of 69 per cent of the average per capita income of the labor force.

The problem to be solved during phase (3) now consists of finding the changes in a number of means to be applied in order to raise employment by 0.5 per cent, to raise investment by 2 per cent of national income, and to raise the average income of workers by 1 per cent of average income per head, while reducing the balance of payments surplus to zero. The means to be applied may be, for example, direct and indirect taxes, government expenditure on investment, and the wage rate. But they may also be other means. As we will discuss later, we must have fairly precise knowledge on the operation of the economy in order to solve a problem of this nature.

Activities can differ from the ones described here; thus, it may be that no clear distinction is made between forecast and plan. Planning activities may start right away with the construction of the plan, skipping the pure forecast. In that case there will be less opportunity to gauge the degree of realism of the plan or the magnitude of the effort needed to carry it out.

We are now going to describe the activities involved in our second example, referring to a more detailed development plan. Here, too, some phases will be distinguished:[3]

(1) A general *reconnaissance of the economic structure* and its possible future development, implying the estimation of

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[3] The activities described here represent in simplified form the work done by the State Planning Organization of Turkey in preparing the Five-Year Plan 1963–67. Cf. also *Programming Techniques for Economic Development* (United Nations, Bangkok, 1960).

a number of structural characteristics, derived from the last ten to twenty years of development.

(2) A provisional choice of the *optimum rate of growth,* implying the necessary rate of savings. Often this choice will be based on an intuitive comparison of the advantages of the future well-being which can be obtained from a higher rate of savings with the disadvantages of the sacrifices in consumption initially necessary to increase savings. As a first rough approximation it will often be assumed that one per cent more rise in income can be obtained with the aid of k per cent more savings, in terms of national income, where k is the capital-output ratio. The rate of growth chosen implies assumptions on the tasks set to the economy; the higher the rate the higher the "tautness" of these tasks or the pressure to be put on all concerned.

(3) An estimation of the *expansion of demand,* both internal and external, in a number of sectors. Often it will be assumed that demand for finished consumer goods depends mainly on the size of the population and income per head and that demand for investment goods depends on the volume of savings. Internal demand will depend on national population and income, foreign demand on foreign population and income. Demand for intermediary goods can be derived from final demand with the aid of input-output coefficients. Demand for capital goods can be derived from the rate of increase in demand for other types of goods, with the aid of capital-output ratios for these goods. Calculations for capital goods themselves serving to produce capital goods, or so-called second-order capital goods, must be based on a more complicated formula combining input-output technique and capital-output ratios.

Production need not be equal to demand for international goods, that is, goods which can be exported or imported. Production must be equal to demand, however, for national goods, that is, goods which cannot be the subject of international trade (buildings, energy, inland transportation, inland trade, personal services). For the corresponding sectors therefore we already have a production estimate.

(4) Subsequently the planning agency may ask for individual investment projects. These have a twofold function. First, they may be used to "fill up" the sector production estimates already made for the national sectors. For the international sectors they serve, secondly, to reveal which goods can most advantageously be produced in the country and which other goods can better be imported, given the necessity to keep the balance of payments in equilibrium. In other words, the analysis of projects must show which sectors have the largest "comparative advantages." A choice can then be made that simultaneously maximizes national product and the gains from international trade. Actually, maximizing the gains from international trade means choosing those sectors which together maximize the national product, while maintaining balance of payments equilibrium.

(5) The choice of projects may, however, also serve other purposes, among them a certain distribution of investments, and hence production increases, over the regions of the country.

(6) From the production targets obtained in the preceding steps can be derived the number of workers—in the widest sense—possessing various degrees of training and skill, which must be available in each year. From these figures and from the demographic and professional breakdown of the population, education tasks can be derived.

(7) Several of the consecutive steps described may have to be revised in the light of later results. All figures will be periodically revised when new data become available.

(8) Conclusions can be drawn from the preceding phases regarding the tasks of the public and the private sectors as

well as the instruments to be used by the government in order to induce all concerned to carry out the plan. Thus, investment activities for the public sector and subsidies or taxes for the private sector may be needed in order to carry out the program.

PROCEDURE

Another group of elements of the planning process will be indicated by the word "procedure," indicating the nature and time order of all contacts with the outside world—contacts with ministries, lower public authorities, regional or sectoral planning agencies, business organizations, trade unions, and research institutions—needed in the planning process. While it is conceivable that a plan can be made with a minimum of outside contacts—e.g. using current statistical information only—there are two main reasons why a considerable number of outside contacts are preferable. On the one hand, detailed information on the economic process and its elements can better be obtained from a number of outside experts, including those handling these elements. Additionally, outside contacts make it possible to exchange opinions with those operating the economy at its various levels and hence may introduce some features of democracy, which are not customary within the single enterprise, but obviously are valuable. Among other things this element of democracy may help to facilitate the acceptance of a plan by parliament as well as its execution.

A usual procedure is that the CPB formulates some data of a general nature—covering both external variables such as population growth and state of foreign markets, and the main aims—and issues these to agencies in charge of making sector plans. In France sector plans are subjects for discussion in a large number of committees composed of government officials and representatives of business and trade unions.

These agencies may issue additional data to subagencies which, in their own sectors, are in charge of plans for still smaller units. In some way or another the agencies approached will, as a second step, submit sector plans to the CPB, which will then study and test them and combine them into either the general plan or, provisionally, a forecast. In countries with a large private sector, sector plans will be more in the nature of forecasts than of plans. For the public sector plans can, but need not, be made from the start. Private sector plans will in any case have a character different from public sector plans, because the private sector will as a rule be influenced in an indirect rather than in a direct way. Only in emergencies will direct measures be unavoidable; e.g. in a situation of acute shortages or overproduction.

Usually the procedure will then direct a second contact with the outside world, especially with the ministries, after the CPB has corrected the forecast or the provisional plan in order more closely to approach the aims. Figures for sectors may have been changed and the sectors will be asked for comments. Sometimes a type of meeting will be held which is very important in making up a plan; it is called a "distribution meeting." Its purpose is to arrive at the optimal distribution, over a number of users, of specified goods or services. For example, a meeting to determine the optimal distribution over a number of ministries of the total building volume available is held annually in the Netherlands.

At a certain stage the CPB may have to submit the draft plan to a Central Planning Committee, consisting of representatives of ministries as well as of social groups, including employers' and employees' organizations, and possibly also counting among its members some experts appointed by the government. At a final stage the draft plan will have to be submitted to the government or even to parliament, in order to be formally approved and given the status of a plan.

It is conceivable that the procedure as described in our example differs for a short-term and a long-term plan in the same country. In Turkey the law on the State Planning Organization requires approval by parliament of the long-term plans, but approval by government only of the annual plans. The procedure will certainly be different in countries with different regimes; it also changes over time in the same country. All countries employing planning procedures will continually look for improvements in procedure. In Chapter 4 we discuss some ways and means to arrive at an optimal planning procedure.

Looking at what seem to be the most important characteristics of the planning procedure as just described, the following alternatives stand out.

(1) The most important alternative may be formulated as the choice between "starting from below" and "starting from above." This means that the first step can be either that plans are made at the lowest level, which may be enterprises or separate "services," or that before these units start their work a number of guidelines are provided by the CPB. Starting from below has often been thought the natural thing to do, since final coordination at the top is always necessary and in the below-to-above alternative there might be less work involved. The general experience seems to have been, however, that rather more duplication is involved if no idea of the general development exists in the lowest units. In fact, demand estimates, in Western terminology, can only be made within the concept of the development of national income as a whole. In many planning processes, therefore, there has been a movement toward starting from the top. An interesting large-scale Western example is OEEC. In the first few years of the operation of the Marshall Plan (European Re-

covery Program), the OEEC Secretariat asked the member countries for their forecasts or plans (the difference not yet being clear) and then started studying them. But in the later years the Secretariat would first formulate a number of general assumptions on which the country forecasts should be based. A considerable amount of duplication was eliminated in this way. Of course the more precise question that matters here and to which we will return later (Chapter 4, pages 87–88, 91–93) is which variables should be determined in this starting phase.

(2) A second alternative concerns the *number of outside contacts* to be consulted. As set out above, two elements seem to be decisive here, namely, the quantity of information needed from various quarters, and the degree of democracy the government wants to build into the planning system.

The quantity of information needed will depend largely on the degree of detail desired in planning. The number of outside contacts made for this purpose will, further, depend on the concentration of required information. Thus, if there are branch organizations collecting economic and technical information from the individual productive units in their branch, this may reduce the number of contacts needed between CPB and the branch. For example, banking statistics in the Netherlands are compiled by the Central Bank, to which the private banks submit their figures. In Turkey, as elsewhere, state enterprises are supervised by ministries, which serve an intermediary function between the planning agency and the enterprises. This procedure has the additional advantage that the branch organizations can better judge the material submitted to them and, moreover, keep some information secret if so desired.

The degree of democracy involved poses such questions as whether the outside contacts should be interadministration only or should include contacts with social groups, such as

employers' or employees' organizations, in order to give then
some say in the matter during the planning process. A fre
quent question is to what extent consumers' organization
or, for intermediary products, users' organizations should b
involved in the regular consultations.

Relative to contacts with administrative bodies anothe
question comes up as to how much the hierarchy is to b
taken into account. Suppose the CPB finds it useful to co
tact some industry, because of a new technical developme
under way; should such contacts always be taken via th
ministry concerned or should they be directly with the i
dustry? In favor of the direct contact is the argument th
this may lead to more confidential information—the mini
try, as an executive organ of government, may be accorde
less confidence than the CPB; in favor of communicatio
along hierarchic lines speaks the argument that in this wa
the ministry is better informed.

(3) A third alternative can be seen in the *frequency of co
tacts* with any single agency. To some extent this depends o
the method of planning used: a trial-and-error method ge
erally implies a larger number of consecutive contacts tha
a more systematic method. The timetable also will be
factor here; for short-term plans with their compressed tim
table, repeated contacts will be less possible than for lon
term plans.

(4) Still another question concerns the *time order of co
tacts* to be made with different agencies. As a rule this mu
follow from the order in which the necessary information
needed. In the administrative sector it may be a question
who must have the "last word." In the more complicat
planning processes, e.g. where a subdivision of the econom
not only into sectors but also into regions is considered, t
question comes up whether the sector or the regional orga
zations must be consulted last. We come back to this questio

in Chapter 4. It may depend on the instruments of economic policy used, which can be sectoral or regional. Decisions on these instruments can better be taken on the basis of more information than at an earlier stage.

(5) A final example of procedure concerns the publication of any plan: should it be published before parliamentary debate takes place or afterward, or even before the government has accepted it? Much depends here on the precise competence of the CPB: it can be considered either an independent advisory body or part of the government machine (and usually advisory also). Publication by the CPB need not be considered as evidence that the plan has been accepted by the government; it may be published as an advice to the government.

TIMING

By "timing" we mean the timetable for all activities involved in formulating a plan, and particularly the outside contacts to be made. For any complicated process the timing element represents an important aspect with considerable influence, for good or for evil, on the degree of success of the operation. The timing problem will be even more important for short-term than for long-term plans, because of the short period available. One of the arts of planning is to stick to the timetable; the usual dilemma being that a draft can always be improved by further work. For an annual plan the timetable of its preparation evidently must be geared to the timetable for the preparation of the government budget and the parliamentary debates on it. Ideally the annual plan should be available at the moment the budget is published and therefore be ready by budget day. Some of its main figures, however, must have been used in preparing the budget estimates and a "plan frame" must therefore be ready some months before budget day. The main difficulties involved are that some of the basic data needed to make a realistic annual plan may be available only shortly before the plan frame has to be available. Among these data are: (1) the general statistical data about the base year, and (2) some of the "data" in the economic sense for the plan year.

Among the latter, figures on agricultural production of annual crops and figures about investment plans—both public and private—are important. Many planners will prefer to take as their base the year immediately preceding the plan year, i.e. the year in which the plan is being constructed. This means that by definition the statistical data are not yet available and must be completed by estimates on the portion of the year still to come. Sometimes it may be necessary to take the year before the current one as the base year.

The timetable will depend on the relative positions of the crop year, the fiscal year, and the calendar year. Often certain statistical data—e.g. income figures—are available for the calendar year but not quarterly or for the fiscal or crop years. Markets for crop products will be more or less determined by the crop figures, known shortly after the beginning of the crop year. It is convenient if calendar year and budget year coincide and are somewhat shifted with respect to the crop year, making it possible to know the crop figures at the moment that the budget and the plan are submitted. None of the relative positions mentioned is without problems, however, and there are reasons why a coincidence of crop year and budget year is desirable.

For the reasons mentioned it is difficult to stay on schedule, and the history of planning shows many examples of plans published after the beginning of the year or period for which they are meant. Dutch plans originally appeared in April, but recently have been published in January; budget day is in the preceding September, however.

For the establishment of a timetable of planning activities the following alternatives are available.

First of all, there is a choice between a rigid and a less rigid timetable. Here again, for long-term plans more flexibility can be admitted, but the size of the planning staff also plays a role. If the process has to be carried out quickly, there is not much escape from rigid timing.

Next, the question of the length of the total planning process can be mentioned. If a somewhat more liberal timetable is desired, the process must be started earlier, with the disadvantage of relying on incomplete data.

In any concrete case, there are the numerical elements of the timetable to consider. The various periods of time allotted to the consecutive elements of the process should be such as to evenly distribute the "pressure" over these elements. Obviously, it would be bad manners on the part of the planning agency if it asked for very quick information from others and itself took a long time to process the data. It is superfluous to say that a precise judgment of the time needed for various operations cannot always be obtained easily.

Finally it should not be overlooked that noticeable advantages may be obtained from correct *timing of auxiliary processes.* They should be started soon enough to make it possible to have the results available at the proper time, namely when they are needed for the main planning process. This means that the first thing to start in any new process of planning is that element of the preparatory processes which takes most time.

For development planning the type of information taking by far the longest time is information on individual projects to be carried out. If development planning has to be started from scratch, the first process to set in motion is the collection of information relevant to development projects. Clearly this information is to a large extent of a technological character and must be obtained from groups of technical experts. The information must be presented in the form of operation accounts and financing accounts before the projects can be appraised. The preparatory work to be done is complicated, and sufficient time must be reserved for its proper execution. Since the bulk of this auxiliary work can be done independently of other phases of planning, it can and should be started at an early stage of the timetable.

METHODS

By "methods" we signify the scientific techniques used in the preparation of the sets of figures constituting a forecast or a plan, more particularly the sets of figures fulfilling a number of conditions, which may be called conditions of coherence. These conditions represent the relations existing among the several variables describing the economy, or more broadly, society. It is these relations that we are accustomed to label, as a group, as the "model" of the economy or society. The problem to be solved is the estimation of a number of variables, some unknown while others are given. Those that are given are the so-called data of a forecast; for a plan the given variables are partly the values of the target variables, partly the so-called "other" data, i.e. the data not controlled by government. The unknowns, as well as the given variables will be different for short-term and for long-term forecasts. Some of the well-known data not under government control are the increase in population, the situation of the world market, and crop figures. Instruments of economic policy which are controlled by government are taxes, public expenditures, interest rates, and import restrictions. For a short-term forecast both kinds of data will be considered given. Unknowns are all the economic variables, such as national income, national expenditure, imports, exports, consumption, investments, price level, wage level, etc. Long-term forecasts may be based on assumptions with regard to the rate of savings, the rate of increase in population, technical development, and foreign demand for the country's products, to quote one possible combination.

In a general way, two types of methods are available for the solution of the problems just mentioned. They represent extremes: on the one hand trial-and-error methods and on the other hand systematic or mathematical methods. The contrast is illustrated by, first, simply trying to find numbers which satisfy the conditions mentioned and, second, finding these numbers by the solution of a set of mathematical equations. However the contrast is less than it would seem at first sight, since mathematics is sometimes no more than trial and error. In some branches of mathematics the only way to solve a problem is continued trying, and the basic principle of computers is similar—depending again on the problem to be solved. Trials can be made less or more systematically as by the method termed "successive approximations," "decreasing abstraction," or the "iterative method."

As already observed, the set of relations expressing all the links between the variables in any given economy or society is often called a *model.* In an economic model we usually distinguish between types of relations: balance relations, definition relations, technical, institutional, and behavior relations (including demand and supply). In each relation we have *coefficients,* usually representing the structure of the economy, *exogenous data* (already discussed), and sometimes *initial values,* indicating the situation of the economy during the base year. Each of these three types of figures must be known before the problem can be solved. Statistical and econometric work done by planners therefore consists of estimating each of these three groups of figures.

In the Netherlands, explicit mathematical models for macroeconomic annual planning have been used since about 1950. The models were improved gradually using the experience gained. The full set of equations was published in 1955 and a revised one in the 1961 Plan. In the model used for the latter plan we find 36 equations under the following headings:

Reaction equations

Spending equations for consumption; gross investment of private enterprises, excluding residential building; changes in stocks; exports (4).

Production factors and capacity for imports; labor demand; labor supply (3).

Price fixation equations for consumer goods prices; investment goods prices; export prices and prices of autonomous demand (mostly public demand) (4).

Definition equations

Relations between quantity and value for six categories: exports, consumption, investment, autonomous demand, imports, total sales (6).

Definition of aggregates: total sales; same, reweighted with regard to labor content; same, reweighted with regard to import content; price of total sales; value of same (5).

Costs and margins: labor costs, value added, gross profits (3).

Unemployment (2).

Incomes: labor, non-labor; disposable labor income, disposable non-labor income (4).

Taxes: indirect taxes; direct taxes on non-labor income (2).

Equations expressing three complex variables reflecting lagged influences exerted by other variables (3).

Some of the symbols used are of a technical mathematical character, especially the three last-mentioned and can only be understood from a detailed description which we will not give here.

For the Turkish Five-Year Plan, 1963–67, an input-output model with some 20 sectors was used as an orientation for the development of sector production estimates.

If the planning problem is given the shape of a system of linear equations, the coefficients of these equations can be presented in the form of a *matrix*. For the solution of the problem the matrix must then be inverted, which is cumbersome if the matrix is large. In the most general mathematical form this work is now being done with the aid of computers. In special cases it can be done more easily. Such cases may also be interesting from the point of view of explaining the model to laymen: some of them can be more easily explained verbally. This is true for degenerated matrices, e.g. triangular or partitioned matrices, some of which will be correct only if simplifying assumptions about the economy have been made. An important class of models is called *star models*. They consist of a macroeconomic model as a "hard core," with systems of equations for the microvariables which can be solved by groups as soon as the macrovariables have been determined from the macromodel. They can be represented symbolically in the form of a star: each group of microvariables being represented by one point of the star. The groups are only connected with each other through the intermediary of the center of the star, representing the macrovariables.

In a general way the various alternatives may be characterized by the number of steps or stages involved, each representing the systematic solution of a portion of the problem.

Perhaps the most typical example of an integrated method is the one elaborated by Professor Ragnar Frisch for the United Arab Republic,[4] preceded by studies on Indian planning. He takes as the main problem choosing an investment program for a number of successive years, described by the quantities of capital to be invested in some thirty or forty "channels." The consequences for the economy are described by a model with a few less sectors, for which a dynamic input-output matrix is used. The criterion for finding the optimum program is given the shape of a preference function in which contributions to national income and employment, changes in distribution, etc. occur. Future contributions of these types are discounted.

Some of the features of Frisch's model are:

(1) Investment outlay in any single channel may extend over several years and show a certain time pattern.
(2) A difference is made between capacity available and capacity used in any sector.
(3) An investment may change the input-output coefficients of some sectors.
(4) The effects beyond the planning period of investments made are not neglected.

As an alternative, a method of planning in stages may be considered,[5] where the process has been cut into pieces, implying the necessity of revision of previous stages on the evidence of the outcome of later stages. A distinction between the following stages is made:

(1) In a *macroeconomic* stage, the rate of investment is chosen, implying a choice of the rate of development.

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[4] Cf. R. Frisch, "Economic Planning and the Growth Problem in Developing Countries," *Østøkonomi* (Special number, 1961).

[5] Cf. J. Tinbergen, "Planning in Stages," *Statsøkonomisk Tidsskrift* (1962), p. 1.

(2) In a *sector* stage, the development of a number of sectors is estimated.

(3) In a *project* stage, a choice between a number of projects is made.

(4) There may be also a *regional* stage, either preceding (2) or following it or even following stage (3), depending on the nature of the planning problem.

Additional stages include a number of preparatory, "partial" research problems, such as estimation of the optimum size of the enterprises in some industries, market analyses, and repetitions of previous stages on the basis of the results of later ones.

Whatever the number of stages into which the planning process may be cut, in each of them there is, in principle, an element of choice with regard to the method to be used. In the macroeconomic phase just mentioned, the nation's production process may be described by various types of production functions, such as the constant capital-output ratio assumption, some form of Cobb-Douglas function, or any other function. In the sector phase a choice must be made between input-output analysis and linear programming, and both may be less or more complicated. In the project phase the criteria used for the appraisal of projects may be varied: a famous discussion on this topic was held in Russia a few years ago[6]; in Western countries very sophisticated methods have been under discussion for some time.

For developing countries the correct appraisal of investment projects, particularly the larger ones, is of fundamental importance. Such an appraisal first of all implies a critical examination of the technological figures used and the corrections applied in order to account for the differences between developed countries (often the origin of the figures) and developing countries. This is largely a subject for technicians, although some coefficients established by economists may be useful, such as the general experience in learning processes.

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[6] Cf. "Les méthodes actuelles soviétiques de planification," *Economies des démocraties populaires,* Cahiers de l'Institut de Science Economique Appliquée, Série G, No. 7 (Paris, 1958).

Once the technical figures are as realistic as seems possible the question of the economic criterion for selecting projects arises. As a rule some yield figure will be calculated representing the ratio r between benefits b and costs c:

$$r = \frac{b}{c}$$

where both b and c must be given a social or national rather than a private meaning. In principle, both are sums of a number of values attached to the various elements. The benefits taken into account should correspond with the aims of development policy and the costs with the use of scarce production factors.

The contributions made to the aims must be derived from the technical data, such as the contribution to national product, to employment of unskilled workers, to health, and so on; the costs are expressed as quantities of capital, foreign exchange, or qualified labor. Each of these contributions or cost items will be expressed in its own units, but in order to make them comparable they have to be multiplied by some price before being added up. The prices to be attached to the contributions to aims are in principle determined by the preferences of the policy makers; the prices to be attached to the scarce factors are, in principle, determined by their scarcity. The latter are often called accounting or shadow prices. Their estimation represents a technical subject dealt with in handbooks of development programming. Often simplified versions of the method just outlined are used. Evidently the number of items to be used in both the numerator and the denominator depends on the circumstances.

If, for instance, only one (main) aim of development policy is recognized—the contribution to national product—and only one scarce factor—capital—the criterion r reduces to the (net) output-capital ratio or the inverse of the recoupment period, as used in communist countries (although not necessarily defined in precisely the way indicated).

A problem which deserves to be mentioned separately is how to deal with future contributions and with future costs. It is customary in Western countries to apply discounts here, but evidently the question then remains what discount rate should be used. An additional problem consists of the estimation of the so-called indirect effects (both on aims and on costs) of any project. Recently the *semi input-output method* has been advocated by the present author.[7]

ORGANIZATION

The word "organization" will be used here to indicate the structure of the hierarchy of agencies and persons engaged in planning. It may refer both to those directly and those indirectly engaged in planning; among these are agencies and persons working in ministries or in technical research institutes. The description will as a rule concentrate, however, on the central planning agencies, indicating the responsibilities, the qualifications needed, and so on. A distinction will be made between the external and the internal organization of the central planning agencies. The former refers to the position of these agencies within the government hierarchy as a whole; the latter describes the hierarchy inside the planning agency.

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[7] Cf. J. Tinbergen and H. C. Bos, *Mathematical Models of Economic Growth* (New York, 1962), p. 83 n.

One main characteristic of the *external organization* is the ministry in which the CPB is incorporated. As a rule this is the prime minister's office; such is, for instance, the case in Turkey. In countries with an American governmental structure, the President's office is the appropriate location. Sometimes the CPB is itself a ministry, as in Venezuela. Sometimes it is an office in one of the other ministries: in the Netherlands it is one of the services of the Ministry of Economic Affairs. Irrespective of its precise place in the government machine it will as a rule have "interdepartmental status," i.e. have direct contacts with all ministries without the necessity of consulting the minister under whom it is organized. It must have, for its proper operation, access to all information available to the government. As a counterpart to these competences it must itself display a cooperative attitude and flexibility in dealing with information of a preparatory nature given to it by various agencies.

In big countries and in countries with a policy of detailed intervention with production, the planning process may require not one single unit (bureau or agency) but a network of them; some may deal with one industrial sector only, others may deal with one region only, and all may be placed under the competence of a coordinating higher unit. There may be even more layers in the hierarchy. Important questions arise with regard to the procedures that must be followed by such a hierarchy of units.

The *internal organization* of a CPB must be derived from its tasks. As a general rule there will be separate divisions dealing with short-term and long-term plans, and pure research may be given to still other divisions. There will be subdivisions for individual industries and for the main functions of the economy: consumption, investment, exports and ɔorts, etc. In general, it will be wise to define the tasks of subdivisions in such a way as to make them more or less ependent from the tasks of other subdivisions. Because :he general interdependency of economic phenomena this l hardly ever be possible completely; there will be a need frequent contacts. Partly these can be expressed in the rarchy, partly they will have to be "cross contacts" and hoc contacts. There may be a need for a specialized co-.inator to oversee these transactions.

Vith regard to internal organization some important al-ıatives may be posed:

(1) Must there be a strict hierarchy or an ad hoc co-operation between the numerous experts?

(2) Must research activities be separated from day-to-day advisory work and decisions or should they be done by the same experts who specialize on subjects?

(3) Must short-term and long-term plans be made by the same staff or should they be separately organized?

(4) Must the activities for each of these plans be organized according to sectors (and regions) or according to functions of the economy (consumption, investment, foreign trade, public finance, labor problems, education)?

:en the answers to these questions will not consist of a ır choice but of some combination of the two extremes.

'artly a matter of external, partly of internal organization he question whether the CPB should have regional and :oral branches and if so, what their status is in the regional ninistration or within any ministry dealing with a particu-sector. The decision will clearly depend somewhat on the : of the country and the degree of detail of economic icy, but even in a small country regional branches may ke sense. If the planning agency does have regional as well ectoral branches or even divisions, the question comes up of the relative status in the hierarchy to be given to each: who will decide on the size of, say, an investment in a particular sector in a particular region? In Western European terms: is there to be national autonomy or sectoral integration (as in the European Coal and Steel Community)? In Russian terms: must the union ministry or the sovnarkhoz have the final decision?

The Netherlands Central Planning Bureau consists of three operative divisions and a division for internal affairs. The former are devoted to (1) research and long-term planning, (2) annual macroplanning and (3) annual microplanning, which in this case means sector planning. The division for annual macroplanning consists of sections for (a) public finance and monetary questions, (b) national accounts, (c) employment, (d) wages and prices, (e) consumption, (f) investment, and (g) foreign trade. The division for microplanning consists of sections for the main economic sectors, such as agriculture, transportation and energy, groups of manufacturing industries, etc.

In developing countries it makes sense to have a separate division for education planning and in large countries there will be scope for a division for regional planning. In many planning agencies these features will be found.

AN INTERNATIONAL COMPARISON OF PLANNING PROCESSES

As a background to the present volume the Netherlands Economic Institute made an inquiry by questionnaire into the main characteristics of the planning processes in a number of countries. Since the United Nations Secretariat (Department of Economic and Social Affairs) had been requested by the United Nations Assembly to conduct a similar inquiry, the questionnaire was the product of discussions with this Department.

The questionnaire was sent to 51 governments and 19 replies were received,[8] some of which were partial answers only. Among the complete replies a number have been chosen for a summary set of tables, to be found in the Appendix. In this section, some comments will be made on the results. These comments will at the same time illustrate some of the points made in the preceding sections of this chapter, based on a priori considerations. Because of the difficulty in getting answers on the more abstract phases of the planning process, not all the points raised in the preceding sections can be illustrated by answers received, but rather the more concrete aspects. Even so the replies must be evaluated with care; they are not always comparable between countries. Several of the more complicated concepts used, such as the concept of a "model," have not been interpreted in the same way by the various agencies.

We will add information known from other sources whenever useful. In no case do we attempt to give complete information; our main purpose is illustration.

Table 1, covering answers to the questions mentioned in that table, gives some information on the *external organization* and the *size* of planning agencies in the countries selected. From it we see that the status of the agency differs, varying from a ministry to a directorate. No doubt the influence exerted by the planning agency varies a good deal also and often depends on personal relations and prestige,

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[8] The replies available at the moment of writing were from:

Bulgaria
Burma
Ceylon
Chile
Czechoslovakia
Ecuador
France
Hungary
Iran
Japan
Federation of Malaya
Morocco
Netherlands
Norway
Poland
Puerto Rico
Turkey
United Kingdom
Yugoslavia

very difficult to catalogue in official schemes or regulations. Generally speaking the "centrally planned" countries give a prominent place to the agency, and the not centrally planned countries—that is, the countries with a less detailed economic policy—a less prominent place. The same distinction applies to the size of the agency, measured by the number of employees. Here we must be cautious, however, in drawing conclusions, since the division of labor between the central planning agency and the ministries may differ among countries. Thus, in Norway probably more work is done by the ministries. For some communist countries not included in the table figures of a few thousand employees are quoted.

From Table 2 about the *origin of the staff* we see that in several countries a fairly high proportion had no prior employment, pointing to the fact that often planning is done by relatively young people. Few universities offered training for planning specialists until recently; hence most products of this training belong to the current generation.

Table 3 discloses that *formal training courses* within planning agencies are not numerous. It is well known, however, that special courses or even schools for training in planning exist in various countries (Italy, Netherlands, Poland, United Arab Republic, United States, Venezuela).

Table 4, describing the main *official tasks* of planning agencies in the countries considered, displays a good deal of uniformity except in the important category of execution of the plans. This is considered to be the agency's task in two out of the four communist countries in the table, and nowhere else. From other information it is known, however, that five or ten years ago planning agencies in a number of developing countries, e.g. the United Arab Republic, had this task also. Today there is an increased tendency to separate the planning and the executive tasks. Information in this table may suggest an underestimation of the "other tasks" entrusted to many planning agencies; usually these are numerous.

Table 5 supplements the previous table with information about the function termed *directive planning* by some of the governments. This evidently means to give directives to lower units, including production units, and, again, it is considered a function of planning agencies only in communist countries.

Considerable detail will be found in Table 6, giving for seven countries data on the *"actors" in the planning process* and the roles they play. These tables again must be interpreted with much care; their comparability cannot be relied upon. Communist countries, except Yugoslavia, have found it difficult to supply information in this form. Detailed descriptions of this aspect of the process exist for almost all communist countries, however. Among the countries shown, Ecuador, France, Puerto Rico, and Yugoslavia stand out by virtue of the large number of organizations—lower authorities and employers' and employees' associations—playing an advisory role. Iran and Japan do not show this structure, except for the Economic Deliberation Council in Japan.

Table 7 summarizes the main *aims of economic policy.* Here we find a considerable degree of uniformity, which may even be larger than the table suggests. It does not seem probable, for instance, that interest in an equilibrated balance of payments would not exist in Greece, Morocco, Norway, Puerto Rico, and Turkey; but these countries may have interpreted this phrase differently than the other countries. In fact, Norway specifies her desire for a long-term external balance, and Morocco and Greece express a similar aim. It is interesting to note that the improvement of the employment situation as well as the establishment of a more equal income distribution are generally felt to be among the main aims. If Poland does not mention the latter, it may be because she feels that it has been reached already.

The goals adhered to by almost all countries therefore can be summarized as to increase national income, to improve the employment situation, to achieve and maintain balance of payments equilibrium, to achieve and maintain price stability, to obtain a more equal distribution of income among individuals, and to obtain a balanced regional economic development.

There is somewhat less uniformity in the *means used,* as illustrated by Table 8. This is only natural, since differences can be expected here between communist countries, developing noncommunist, and developed noncommunist countries. Communist countries use the largest number of means and developed noncommunist countries the smallest number. Within these categories, however, some show deviations from the average pattern (if the use of such a concept is permitted with the small sample we have here). Thus Poland has used somewhat fewer instruments than the other two communist countries; Greece and Morocco fewer than the other developing countries, and Norway several more than the other developed countries.

Almost all countries consider investment expenditures an important means of economic policy. Profit and income taxes, general or specific indirect taxes, and import duties are widely used. Wealth taxes and export duties are somewhat less general. The use of wage, interest, and exchange rates is mainly confined to communist or developing countries; exceptions are the Netherlands, using the wage rate, and Norway, using the interest rate. Quantitative restrictions on imports, subsidies, and credit restrictions are not used as major instruments by any of the developed countries except Norway.

Table 9 gives considerable detail about the *subdivision into sectors* used in planning for various economic variables by the agencies shown. Again a warning must be voiced that the term sector may not have been interpreted the same way by the various agencies. But it seems clear that the developing countries work with simple models only, whereas the developed countries, except Japan, use many more sectors. With the exception of Yugoslavia, the communist states have not answered this question. From other sources it is well known, though, that communist countries are still planning hundreds of production items, sometimes a few thousands of them, separately.

Table 10 shows the degree of detail used in the *planning of exports.* Again the developing countries appear to use simple models only, partly as a consequence, it seems, of their simpler structure. Planning of exports, in the sense of forecasting, is done in considerable detail in the Netherlands, where a subdivision into many areas of destination and groups of commodities is applied.

Table 11 tries to inform us about the *number of investment projects studied* in the various planning agencies. The footnote discloses some of the factors influencing the figures, one of them evidently being the division of labor between the central planning agency and the ministries. We may add that in the Netherlands the study of individual investment projects by the central planning agency has occurred only a few times during more than ten years; planning is used in this country much more for macroeconomic purposes. The same seems to apply to Norway, but the situation in France is quite different. In several developing countries, for instance Turkey and the United Arab Republic, development plans are based on a systematic appraisal of hundreds of investment projects for which a number of different criteria are calculated.

Table 12 gives an impression of the *character of the projects* analyzed. By and large the figures reflect the differences in structure in the various countries; but some incidental factors have been at work again. In Turkey the agency dealing with energy planning is well developed and its activity has preceded that of agencies in other sectors, thus influencing the number of projects dealt with in the central planning organization. The figures for Iran are clearly a consequence of the small number of projects dealt with in the period under consideration.

Tables 13, 14, 15, 16, 17, and 18 refer to the *scientific methods used by the planning agencies.* This subject is least appropriately handled by a general questionnaire. The tables can give only a general and necessarily somewhat vague impression of the methods used. Table 13 illustrates the *importance of trial-and-error methods* for planning; everywhere economic models are used only—if at all—in combination with trial-and-error methods. Even in the Netherlands, where an algebraic model of some thirty equations has been used almost from the start—revised periodically—common sense checks taking the shape of trial-and-error adjustments have always been used, especially in discussions with other agencies.

Table 14 represents an attempt to disentangle the logic used for the *estimation of some of the basic macroeconomic variables* of an economy. No very useful result has been obtained, however. Partly this is due to the fact revealed by the previous table, namely, that so much use is made of trial-and-error methods. Little uniformity of approach seems to exist either; the table does not show one case of uniform application of an approach. More particularly, there is not a single variable which has been taken as an exogenous or given target variable by all countries considered. Exports are most often reported to be of this character, probably because the countries consider world demand as something beyond their control. It is not easily understandable why employment has so infrequently been reported as a given target. For developing countries this may be due to the difficulty of reaching a desirable employment target at all. In many of these countries government planning agencies have had to content themselves with less than the desirable level for lack of sufficiently labor-intensive projects or for lack of investable funds. Imports have been considered given only in cases where exports have also been placed in that category. Clearly this reflects a situation of scarcity of foreign currency, which makes imports dependent on the possibilities to export. It stands to reason that savings have almost never been considered given: as a rule it is the purpose of development policy to step them up.

Of the variables not considered given beforehand, the majority seem to have been estimated with the aid of overall macroeconomic models, trial-and-error estimates, or common sense reasoning. The use of detailed economic models is not widespread; in the Netherlands, where the most consistent use is made of models, a macroeconomic model with some thirty equations is used. Several other countries have been working at models recently (France, Norway, the United States) but they have not used them so far in the actual planning process. Even the communist countries are in the same position, it seems. Among the variables estimated with the aid of models of some sort, savings is virtually never a subject of such an approach, but consumption is, as well as production and investment. This is probably due to the availability of better data on consumption, production, and investment than on savings. The number of countries that reported taking prices as given is remarkably small, even for long-term planning purposes. In conclusion, we think that much more detailed inquiries will be needed in order to get precise answers to the question of methodology used.

Table 15 constitutes an attempt to find out to what extent *economic relationships,* when they are used, have been established by more sophisticated methods. It is apparent that even such a simple method as multiple correlation analysis is used only rarely, not to speak of simultaneous equations estimation.

Table 16 summarizes the answers given to the general question of the *length of the trial-and-error process,* when used. A probable interpretation is that the process is not particularly organized when "successive rounds" are characteristic, and somewhat more organized when two "stages" have been reported with a name for each stage.

Table 17, by putting the question only with regard to the *testing of consistency* rather than to the way in which the figures have been obtained, seems to give more weight to the use of models than some of the preceding tables do.

Finally, Table 18 summarizes information obtained on the *criteria used in the appraisal of investment projects.* Clearly the first four tests mentioned—the national income, balance of payments, employment, and private profitability tests—are used frequently. What precise meaning the agencies have attributed to the phrase "combination of tests" is not clear. There are some widespread misunderstandings as to how tests should be combined. Often one test is considered the main test and the others used only where the main test is favorable. This is not a correct method. Here again more precise questions have to be put before conclusions can be drawn. Here we are, no doubt, at the frontier where questions deal with matters still in the academic sphere, and where it would be unreasonable as yet to expect that the correct methods are being used. There is hardly agreement about what the correct methods are.

In conclusion we want to repeat that we consider the inquiry only a first step in the attempt to obtain a better insight into what is being done in the planning agencies. The complexity of the subject did not permit, in the time and with the means available, deeper investigation. The nature of the subject requires an individual approach in order to penetrate into the details.

2 INFLUENCE EXERTED ON THE GENERAL ECONOMIC PROCESS

FROM UNPLANNED TO PLANNED POLICY

In this chapter an attempt will be made to gain an insight into the influence exerted by planning on the general economic process of a country. This should be understood as an attempt to estimate the "product" of the activity described in the preceding chapter. Before embarking upon this attempt we may summarize what we think are the essential differences between an unplanned and a planned policy. The characteristic features of a planned policy are, as we have observed already:

(1) Estimation of future developments as a basis for policy decisions instead of relying on the past evidence available at the moment of decision.

(2) The explicit formulation of more general aims of policy, in the ideal case for the economy as a whole, instead of incidental action.

(3) Coordinated action instead of random action by individual ministries or services.

The process from an unplanned to a planned policy in the sense just explained has been a very gradual one. Long ago, when the word planning had not yet been invented, the elements of planned policy just enumerated were not wholly absent. Thus, even if no formal forecasts were made, policy makers had some ideas on what the future course of events might be. In many cases they may have used, consciously or unconsciously, what we now call one of the "naïve" methods of forecasting—for instance, by simple extrapolation of recent movements or by assuming no movement at all. As is well known, cyclical downturns were not foreseen, leading to overproduction or, once they had occurred, to overpessimistic views on future development.

The formulation of aims of policy became more necessary after the belief in laissez faire was given up. Before that time there was no need for planning, since it was believed that free economic forces would lead to the best development conceivable. When this belief died it became necessary to formulate norms for optimum development. One of the current difficulties is that among many politicians, probably as a consequence of our education system, a preference exists for thinking in qualitative terms only. But an economic policy must be based on quantitative as well as qualitative formulations.

Coordinated action finally is somewhat at variance with the widespread acceptance, in Western countries at least, of the individual responsibility of ministers. Strictly speaking, each minister is free to determine his own policy. Cabinet policy, in the form of coordinated action, is not even a legal concept in many countries. In practice, most governments have a cabinet policy in dealing with larger issues and with emergency situations. The realization of its necessity developed in wartime and in the period of the Great Depression. For developing countries cabinet policy is more and more considered essential, as a consequence of the emergency of extreme poverty in which they find themselves.

The most important characteristic of coordinated action is its avoidance of inconsistencies. Inconsistencies may exist among the aims and they may exist between a set of aims and the set of instruments considered admissible. An elementary example of inconsistency in aims is one where a country would aim simultaneously at: (1) increased consumption, (2) increased investment, (3) decreased foreign assistance, and (4) decreased production, e.g. by a decrease in working hours. This set of aims violates one of the relationships of fundamental significance in economics, namely the overall balance equation saying that national product plus foreign assistance must equal consumption plus investment.

More complicated possibilities of inconsistency may occur when the number of instruments a government is willing to apply is smaller than the number of targets it wants to attain. In a somewhat general way we may illustrate this situation by assuming that a government wants to attain balance of payments equilibrium and full employment but is prepared to apply only one instrument, namely government deficit or surplus on current account. In most situations the level of government deficit necessary to attain full employment does not coincide with the level needed in order to equilibrate the balance of payments. The inconsistency does not now necessarily exist between the aims of the policy as such; if the government were willing to apply an additional instrument of policy, e.g. changes in the exchange rate or in the level of wages, the two targets might be attained simultaneously.

Inconsistencies in development policies will above all present themselves in the shape of neglect of the numerous complementarities which are characteristic of an efficient process of development. A well-known example is the neglect of an import quota for spare parts, which must complement imports of capital goods of all sorts. Another typical example is the lack of repair facilities often leading to a large stock of relatively new capital goods remaining unused, for instance buses in local transportation. A third example is the lack of coordination between the process of building and the ordering of new capital goods, leading to the situation when for several months machines have to be stored without being used, or worse, remain in the open air exposed to weather influences. In one country where it was customary to build a hotel next to a new factory in a remote area, for possible visitors, a shortage of financial means prevented the factory from being built although the hotel was already completed. In another—otherwise extremely successful—country the road system is far behind the development of manufacturing industry. An important inconsistency in the execution of the plan of a big country resulted in a tremendous vicious circle bottleneck: a shortage in steel because of a shortage of coking coal, a shortage of the latter because of a shortage of freight cars, and a shortage of cars because of the shortage of steel. There are numerous other possibilities of inconsistencies in development policies, that is, any deviations from the relationships representing the most desirable development.

Inconsistencies can often be most easily discovered by the use of exact methods of analysis, i.e. by a mathematical approach. In practice this need not mean a very complicated approach, but it does imply an explicit rather than an intuitive treatment, and an expert treatment rather than a popular or "practical" approach. Well-trained economists were pointing out possible inconsistencies long before planning was practiced, and economic analysis remains the main ingredient needed for coordinated action. Mathematical formulation will help a good deal, however, in arriving at a succinct statement of the essential questions involved.

CONTENTS OF PLANS

In the last decade or so a considerable number of plans have been published; the U.S.S.R. has issued plans at more or less regular intervals ever since 1928. These, however, will not be considered in this study. The number of pages in published plans varies from a few tens to a few thousands. Notwithstanding an enormous difference in the volume and quality of these publications they have some common characteristics which will now be discussed briefly.

As a rule they contain, first of all, a survey of the aims and guiding principles of the development policy of the country considered. The larger part of most plan publications is devoted to a description in figures of the desired development, referring to the country as a whole and to the main sectors—agriculture, mining, manufacturing industry, energy, transportation and trade, building, the government sector, and some "social" sectors, such as education and health. The degree of detail given varies widely; in the most complete publications large numbers of individual projects are added. Such lists will be found, for instance, in the Turkish 1963–67 plan and the 1960–65 plan of the United Arab Republic (southern region). Some plans contain extensive figures on educational activities.

Most plans concentrate their estimates on production and investment figures, so much so that often a plan is considered synonymous with a program of investment projects. Some of the more precise plans also contain estimates on the volume of employment to be created and the development of the balance of payments and its components.

With regard to the implementation of the policy a number of plans mention some of the qualitative measures which the government proposes to take, ranking from fundamental reforms such as land reforms and nationalization schemes to detailed measures for the tax system or for social insurance or health. Thus India's First Five-Year Plan contains announcements about what the government proposed to do in order to obtain the "socialistic pattern of society" it was striving for. Turkey's First Five-Year Plan contains, among other things, announcements of a reorganization of the state economic enterprises and of the administration.

Because of its nature as an official document a plan publication usually states the results of the planning process but does not enter into discussions of the methods used or of possible alternatives. This means that especially the more elaborate plans are dull texts and the reader feels that the most important information is withheld from him. In order to provide the information the policy maker really needs for his decisions more must be said about the methods used, the possible margins of error in the figures used, the available means of policy, and alternative solutions. As a rule only scanty indications about these four subjects will be found in the published plans. As already observed, some plans do contain the mathematical model used, but this is seldom the complete method. Margins of error may be dealt with by indicating lower and higher limits to some of the most strategic data, such as the rate of growth of the population or the price level on the world market. Some of the most important means of policy, such as fundamental reforms, are usually mentioned, but their precise influence on the socioeconomic situation is, of course, a matter for conjecture only and other, simpler means are often not mentioned. Only very rarely will the wage level required to keep exports competitive be indicated; only seldom will a precise enumeration be given of the extent to which the various means of an industrialization policy must be used in order to attain the goals set.

There are two main reasons why, for the time being, such relevant information is largely lacking in most published plans. First and foremost, our knowledge about the influence exerted by the various policy means and even our data on the economic development of a country are very limited still and subject to large margins of uncertainty. Secondly, most governments will rightly fear that a more explicit treatment of such questions may endanger acceptance by parliament and the public of any plan or policy. It will facilitate criticism without compensating for that drawback. All this means that only after a further successful development of our knowledge will it be possible to expect more explicit treatment of these problems in the plan publications; but if this development of knowledge is indeed successful public opinion will require that it be used. Even before that, however, there is scope for more precise treatment of a number of the questions mentioned in those plans which, according to present standards, fall short of the level of the better plans already available.

DRAWBACKS OF COORDINATED ACTION

Coordinated or planned action does show some less desirable features too. In a proper appraisal of a planned policy these must also be considered. They have been eloquently—although somewhat acidly—set out by an author like Professor Jewkes[1] and may be summarized under the following headings:

(1) Coordinated action is time-consuming. Indeed coordination, as well as government action, generally requires time, and the free activity of free producers can be quicker.

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[1] John Jewkes, *Ordeal by Planning* (London, 1948).

(2) Decisions to be taken by public authorities, in cases of regulation of markets, must be based on the incomplete information available: a number of technical and commercial details known to individual producers may not be available at the higher levels.

(3) Central decisions may imply bigger mistakes than decentralized decisions, since the latter are taken by a larger number of individuals whose decisions, when wrong, may partly neutralize each other.

When considering these features ascribed by Professor Jewkes to planning, one should be aware that he uses this word in two different meanings: on the one hand, in the meaning we have given to it and, on the other hand, in the meaning of a policy of detailed intervention with the production process.

In a general way the drawbacks just indicated will increase considerably the larger the number of instruments of economic policy, that is, the more detailed the interference with the production process. The phenomena just listed are among the reasons why there indeed seems to be an optimum degree of interference with production; beyond this level the advantages turn into disadvantages. On the other hand the drawbacks discussed seem to be of only secondary importance in many cases of a more global type of policy.

In the framework of our treatment of planning as one of the productive activities of an economy we may cover the same ground by introducing the concept of the *costs* of planning. These do not consist only of the costs in the usual sense of money flows corresponding with the salaries paid to planning officials and with the use of buildings, equipment, and raw materials (paper etc.), but also of the costs incurred by those agencies and production units whose assistance is asked; in addition, we may even think of a money equivalent to psychological strains created. The usual cost functions will more or less apply, expressing an increase in total costs, the larger the number of acts of planning. The various activities may be subdivided into groups of activities and estimates made about the volume and the price of each of these in order to arrive at an assessment of total costs. As with any economic activity, planning should be carried on to the point where marginal revenue equals marginal cost. In a general way, the effect of the first "units" of planning activity will be larger than the effects of later units; there will be decreasing returns. It is also probable that the effects of the first few units are substantial, for the simple reason that the national economy produces such a high figure of net product that savings of the order of magnitude of one ten thousandth of it already far surpass the annual budget of any planning unit. With an increasing volume of planning the consecutive possibilities of further savings become less and less and it may well be that the contribution of the one-thousandth member of the staff can only be negligible.

THEORETICAL ANALYSIS OF THE INFLUENCE OF PLANNING

In principle, the influence exerted by planning must be estimated with the aid of a *comparative analysis:* we must compare a situation (or a development) in which planning has been applied with one in which it has not been applied, leaving all other data unchanged. We have to solve several problems before we can carry out such a comparative analysis.

To begin with, planning will always be part of a specific policy. Strictly speaking, therefore, we can apply our analysis only to the combined effect of that policy and its planning. Then, as we have already explained, even in an "unplanned" situation or development some unconscious forecasting will have been done. We must know what has been done or we must at least make assumptions about it. In the unplanned situation there may not be, moreover, a complete absence of policy; on closer consideration we will often find that the main difference from a planned policy is that action is taken after some adverse development has occurred and in a trial-and-error way.

It will often be difficult to say, therefore, what precisely would have happened in the absence of planning. Sometimes we may make some general assumptions, however; we may say, for instance, that much of what happened before 1914 was typical of a nonplanned economy and we can take some of the characteristics of that period as representative for an unplanned development.

It will be clear that the gap between what is likely to happen with and what is likely to happen without planning will sometimes be small and sometimes large. This subject will be taken up in Chapter 3.

Precise theoretical analyses can be made more easily for simple, well-defined cases than for complicated situations. As a first example, let us consider a policy of *production restriction of a primary product.* Suppose we know, from econometric analysis, the supply and demand functions of the market of that product and the development of the exogenous variables of that market. In the simplest case the main exogenous variable will be income of the buyers of the product. With the exogenous variables given for a certain time period we can determine the prospective course of prices and turnover of the product. This we may call the unplanned development. We can now estimate a planned development by replacing the supply function by administrative decisions on the volume of production for each successive year. With the aid of the demand function and the same development of buyers' incomes as in the unplanned situation we can now estimate the development over time of the prices and turnover under the planned situation. The influence exerted by planning on each of the endogenous variables of the market can now be estimated. Particular interest will be attached to the course of producers' incomes. We can even try to maximize these by varying the administrative decisions about the volume of production. Before identifying the corresponding development as the best conceivable we must pay attention to the consumers also.

This is only a first approach to the problem, however. To identify unplanned policy solely with the continuation of free enterprise is not always correct. A somewhat more sophisticated unplanned policy may be one where some production restriction is applied, although it is not based on any knowledge of supply or demand curves or the future course of incomes. On the other hand, even the planned policy cannot actually be based on a perfect knowledge of either future incomes of buyers or demand elasticities, but only on estimates and these may be wrong. Both of these conditions tend to reduce the difference between planned and unplanned policies and their effects.

Similar analyses can be made for markets of a more complicated character. Interesting examples of such markets are those of durable goods. With the mechanisms found by econometric analysis for, say, the markets for ships, houses, or automobiles[2] we may carry out similar comparisons between two developments: one where no interference with the market mechanism is assumed and one where a certain type of interference is assumed to exist.

For the broader aspects of planning it will be even more interesting to apply similar types of analysis to the economy as a whole; but here, by necessity, we must make simplifying assumptions of a more drastic character, or, in other words, we must use macroeconomic models, which as a rule will be less accurate. The simplest approach to our comparative study may be based on some very general assumptions taken from crude experience. Thus, in order to appraise a policy of anticyclical public finance we may simply assume that this results in reducing the variations in unemployment from what they were before 1914 to what they were after 1945. Or, in order to appraise a policy of planned development, we may simply assume that this results in reducing unused capacities from what they were before 1914 to what they were after 1945 and in stepping up the rate of investment from the pre-1914 to the post-1945 level. Alternatively, we may say that it results in reducing unused capacities from what they were in the United States before 1914 to what they were in the Soviet Union after 1926, with a similar assumption about the rate of investment. This can hardly be called a theoretical analysis and it is open to a number of criticisms. We must be able to prove that no other important differences in data influenced the patterns we are comparing.

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[2] Cf. J. Tinbergen, *Econometrics* (New York, 1951), pp. 143 ff.; G. C. Chow, *The Demand for Automobiles in the United States* (Amsterdam, North-Holland Publishing Company, 1957).

A theoretically more satisfactory comparison uses the same macrodynamic model for the two developments to be compared. Again we may first assume that the course of the exogenous variables is known beforehand and we may then compare the outcome of two policies; for an appraisal of planning an anticyclical policy we may compare the results of a policy in which public finance is operated in the traditional way and one where it is operated in an anticyclical way. For an appraisal of a planned development policy, we may compare a policy of laissez faire and one of deliberate development. Again, we may have to introduce the possibility of wrong forecasts, which would reduce the effect of a planned policy, and the possibility of wrong assumptions about some coefficients, having the same consequence.

In order to compare a policy of laissez faire with one of deliberate development we must, above all, have in the model an investment equation, that is, a relation explaining the changes in investment volume in terms of all the relevant phenomena which influence it. Among these phenomena are the level of profits after tax, the liquidity of enterprises, the rate of increase in demand, and the rate of interest, which could be summarized as the economic variables. But there are also factors at work such as the facilities available—energy, roads, technical assistance, level of education of workers, stability of government, intentions of government—which contain extra-economic components. Our knowledge about the impact of all these phenomena on investment activity is quite limited. Even the explanation of investment fluctuations in developed countries, where the extra-economic components do not change much and can therefore be neglected, has not so far been too successful.[3] This has induced even the planners using mathematical models either to use alternative equations or to use direct information on investment decisions rather than an equation. To explain investment in developing countries, where the extra-economic factors play a considerable role, is much more difficult. This means that it is virtually impossible, with the present state of our knowledge, to make a theoretically satisfactory comparison between what happens with and what happens without planning. Moreover it would not even be easy to indicate which of the explanatory phenomena will be different in the two situations, because of the gradual transition from a nonplanned into a planned situation which we witness—a fact already mentioned.

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[3] Cf. John R. Meyer and Edwin Kuh, *The Investment Decision* (Cambridge, Mass., 1957).

EMPIRICAL EVIDENCE

In order to obtain a clearer insight into the influence of planning in more complicated situations one may at least try to obtain detailed inside information about the process so as to ascertain the role played by planning. This is not equivalent to ascertaining its full influence since it is difficult, in the more complicated situations, to know what exactly would have happened in the absence of planning. Part of the role played by the planners would, in the absence of planning, have been played by others. The points made may be illustrated with the aid of three case studies concerning central planning by the Netherlands government after 1945.

The first case refers to the establishment of a *deflation program* in 1951 (and one in 1957 along similar lines), when the country's economy was characterized by a balance of payments deficit and threatened by a further deterioration of its foreign exchange balance because of an obligation to step up armament. The program consisted of a number of deflationary measures including: (1) reductions in civilian public expenditure; (2) increases in various taxes; (3) a wage increase of only one half of the increase in cost of living to be expected from (4) a reduction in subsidies on consumer goods.

The order of magnitude of the program for 1951 may be illustrated by the size of the reduction in total civilian expenditure—private and public—carried through: this was no less than seven per cent of national income.

The planned character of the policy implied, with regard to procedures followed, that it was prepared by the Central Planning Bureau in consultation with various ministerial representatives on the one hand and with the Social–Economic Council on the other hand. In this Council, one third of the members are representatives of trade unions, one third represent employers' unions, and one third are experts appointed by but not responsible to the government. It was essential that the trade union and employers' union representatives participate in the discussion of the situation before the program took final shape.

With regard to content the planned character of the program appears from two main characteristics: namely, that the total amount of deflationary impulses advocated was geared not only to the direct effects but also to the indirect effects to be expected, and that contributions were asked from almost all groups of the population.

The role played by the planning agency was central because all the figures, and more particularly figures about the indirect effects to be expected, were calculated by it. The role played by the other persons and agencies mentioned was clear enough too, since it was essential to the desired procedure that they be involved. This is particularly true of the role played by the Social–Economic Council, which was required by the law.

The key to the success of the program has been considered to be the agreement of the trade unions with it, even though the wage policy mentioned under (3) was, on the face of it, not an easy thing for them to accept. Their acceptance was only possible because:

(a) There was an atmosphere of confidence between trade unions and government, the latter being composed of political parties in which the three main trade union organizations had considerable influence, namely, the Labor Party, the Catholic People's Party, and the Calvinist Party (ARP).

(b) The program tried to establish an equilibrium among the contributions asked from the various groups of the population.

An attempt to guess what might have happened in a less "planned" situation leads to the probable conclusion that a similar policy would have been carried out, with the following possible differences:

(a) Probably the extent of the program would have been insufficient because of the neglect of some indirect effects.

(b) The acceptance by the trade unions might not have been obtained, with the possibility of strikes and of higher wages than desirable and hence more unemployment.

(c) The policy might have been started at a later moment, based on past evidence of the balance of payments instead of on forecasts made half a year ahead.

It has been contended that the success of the program was partly due to the change in the world economic situation in the second half of 1951. This no doubt affected the 1951 figures, but it is probable that the favorable subsequent development of the country's economy is largely due to the 1951 policy program, which was formulated on the basis of pre-1951 data. As already observed, a similar policy was again proposed and carried out in 1957, although some felt that this second program was too small.

The second example to be discussed refers to a *"reflation" program* for 1953. Partly as a consequence of the previous program and partly because of the changed world economic situation (the post-Korean price fall), unemployment increased toward the end of 1952 and surpassed the "danger level," suggested by the Central Planning Bureau, of 3 per cent of the so-called dependent labor force (those working as employees of others, not as independent entrepreneurs). The Planning Bureau again prepared a program, this time to increase public investment, and it was again discussed in the Social–Economic Council. This time no unanimity was reached, since a group of members fearing excessive inflation of the volume of money voted against it. The government accepted the program, but it was not necessary to carry it out since the emergency situation created by the floods of early 1953 soon required additional investments surpassing the proposed volume.

Again the role of the planners in the preparation of this program was clear enough. An attempt in this case to guess what would have happened in an "unplanned" state leads us to believe that the program would not have come into existence, for the following reasons:

(a) Most politicians at that time had not yet accepted wholeheartedly the obligation of the government to take action when the 3 per cent unemployment level had been reached.

(b) The tendency prevailed to follow a trial-and-error policy, meaning that the government would have waited until higher unemployment developed and then tentatively would have increased its expenditures, probably to an insufficient degree.

The third case to be discussed refers to the policy of *stimulating productivity*. Around 1950 many European countries had been convinced by their American advisers that European productivity was low and might be consciously stimulated by "productivity centers" in a large number of industries advising both employers and employees about methods to increase labor productivity. At that time the task was considered sufficiently important to charge a new minister with it and this minister, Professor A. H. M. Albregts, asked the Central Planning Bureau to estimate the macroeconomic consequences to be expected from a plan for spurring productivity. The analyses made by the bureau revealed what was certainly a surprise to all concerned: that an increase in productivity by a single small country might well, over a short term—during a period of one or a few years—create difficulties along with some advantages. These difficulties could be either increased unemployment or an increased deficit on the balance of payments or both.

Some of the reasons are that in the short run the increase in productivity will not raise the demand for exports sufficiently to pay for the increased imports of raw materials, and it will reduce the number of workers needed. In the longer run the increase in demand for exports may solve both problems. The problems would be less serious if other countries also increased their productivity, leading to cheaper imports into and higher demand for exports from the country considered. The analyses also showed that what could be successfully undertaken in the short run was a *selective* increase in productivity, directed at three types of industries: (1) those with a shortage of manpower; (2) those whose demand elasticity is high; and (3) those whose import needs are low.

The program accepted and defended by the minister was based on these ideas. In this case the role of the planners is rather clear; had they not been asked for advice, the idea of a selective productivity policy would not have been advanced.[4]

Numerous examples of the influence exerted by planners on the decisions of private enterprises are supplied by the French experience, where contacts in the mixed industry committees have been very fruitful. The planning of manpower and training needs in many industries had its origin in such contacts. Previously, employers had not been accustomed to look ahead over a sufficient number of years to understand the necessity of educating more skilled workers.

The impact of planning on the economic progress of developing countries can be estimated in a very broad and crude way by comparing their development before and after the Second World War since no planned development took place before that war. For many Asian and African countries this means at the same time a comparison between the colonial regime and the new independent government.

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[4] For a formal treatment of the problem cf. J. Tinbergen, *Economic Policy: Principles and Design* (Amsterdam, North-Holland Publishing Company, 1956), section 4.251.

Before World War II development of the countries concerned was slow and subject to the cyclical movements emanating from the unplanned development of the industrial countries. For large areas of Asia and Africa the rate of increase in national product did not surpass that of population, keeping the income per head at a constant level. Investments were in the neighborhood of 5 per cent of national income and were mostly directed at the expansion of primary production, that is, agriculture and mining. The inflow of foreign capital in a country such as India has been estimated to have been some one per cent of national income on the average. At present the level of investment in most developing countries is higher: some 9 per cent in Asia, some 8 per cent in Africa, and some 11 per cent in Latin America. Investments are more diversified; manufacturing industries are now an important object. In the first decade after the war the pattern of investment was not yet based on very systematic analyses of the development potential of the countries and was often influenced by personal preferences of rulers, who displayed in several cases a taste for monumental investments. In some countries the road system was given undue weight; big irrigation dams were favorite projects, as well as large buildings.

Gradually the choice of investment projects became more sophisticated. The International Bank for Reconstruction and Development introduced a practice of careful scrutiny, first of single projects, later of integrated development programs. Other United Nations agencies in various fields followed and gradually more equilibrated investment programs were established. Investment in small-scale enterprises, technical assistance and training, and an increased emphasis on the creation of employment all helped to attain this more balanced type of action. While the vast majority of programs are still based on national analyses, a beginning of international coordination is now emerging. Over the period 1950/51 to 1958/59 gross domestic product rose by 3 per cent per annum in India and Pakistan, by 4 per cent in Indonesia, and by 6 per cent in Brazil. These figures may well be representative for the continents these countries represent.[5]

The role played by planning, to give a more concrete illustration of its impact on development, may be summarized by stating that in most developing countries nowadays the planning agency is directly involved in supplying to the government figures on the desirable rate of development and on the projects to be included in the government program. A huge number of projects have been analyzed in such countries as India, Pakistan, the United Arab Republic, and Turkey, to mention only a few, both for such programs and for financing by international institutions.

DEVIATIONS FROM PLANS IN ACTUAL DEVELOPMENT

While considerable influence has been and is being increasingly exerted by planning on actual economic and social development this does not imply that real development coincides with the plans. Important deviations occur and more often on the negative than on the positive side: actual development is less favorable than hoped for.

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[5] Cf. *World Economic Survey, 1961* (New York, United Nations, 1962), table 1–5, p. 21.

Central Planning

The outstanding example in the field of development planning is the disparity between actual development in India during 1956–60 and the Second Five-Year Plan; roughly speaking only 75 per cent of the growth hoped for was attained. To a considerable extent this was due to a lagging development in agriculture, which itself was partly attributable to unfavorable weather conditions. Another reason for the deviation from plan was the disappointing flow of foreign aid. Still another portion of blame must be imputed to the complex of difficulties characteristic of most developing countries: a complex of human attitudes which it is not so easy to change quickly. Insufficient training, knowledge, discipline, and integrity (in the sense of behaving according to the rules of a modern society) are at the center of present problems. There is also a lack of willingness on the side of the developed countries to make the efforts in the public as well as the private sector that are needed to complement the developing countries' own efforts. Often this lack of willingness is rationalized by referring to the political risks of unexpected changes in economic policy or of nationalization.

Disparities between planned and actual development can be observed continually also in short-term planning. As already observed (cf. Chapter 1, pages 9–13), a normal element of any such planning process is to compare the current situation with the aims of policy. The gap found between these two sets of figures is identical with the difference between the actual situation and the planned situation as long as no change in aims occurs, because the planned situation and the set of aims are identical. In most annual plans an analysis is made of the deviations, followed by an attempt to classify their causes. Ideally these causes can be of one of the following three types:

(1) There may be a deviation in the policy actually fol-

lowed by the government machine from the recommended policy.

(2) There may be a gap between the policy recommended and the "correct" policy as a consequence of a "wrong" forecast of some of the changes in data.

(3) There may be such a deviation because of the use of a "wrong" model.

In recent years several studies have been made of the role played by these various causes. Evidently causes of type (1) cannot be considered failures of the planning methods used, but causes of types (2) and (3) do represent such failures. In view of our imperfect knowledge of the operation of economies their occurrence is to be expected. Each model is in a way "wrong." An early survey of the results obtained by the planning agencies in the Scandinavian countries, the United Kingdom, and the Netherlands[6] showed the degree of success obtained by forecasts of twelve variables. The forecasting coefficient Ψ was calculated as the ratio between (a) the standard deviation of the differences between real and predicted values and (b) the standard deviation of the annual changes in the variable considered.

From the table on page 64 we see that the balance on invisible items in the balance of payments is a very difficult figure to forecast; partly this is due to its being a difference, and partly to the lack of good statistics, but it is also due to the sensitivity of these items to keen international competition. The very favorable figure for Dutch exports may be attributable in part to the particular care given to this item in Dutch planning, such as the decomposition of exports into a large number of items.

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[6] H. Theil, "Who Forecasts Best," *International Economic Papers*, No. 5 (London and New York, 1955), p. 194.

The following table summarizes some of the results (for the variables predicted by all countries compared):

Forecasting Coefficients Ψ[a]

	NL	*GB*	*N*	*S*	*DK*	*Average*
Export value	.16	.26	.76	.62	.53	.40
Import value	.26	.25	.73	.48	.51	.41
Balance invisible items	.29	.91	.97	1.30	.57	.72
Balance of payments surplus or deficit	.48	.52	.76	.71	.73	.63
National product	.53	.63	.66	.78	.56	.63
Industrial production	.54	.51	.59	.52	.81	.59

[a] For definition, see text. Countries are indicated by the following symbols:

NL	Netherlands
GB	United Kingdom
N	Norway
S	Sweden
DK	Denmark

3 THE INFLUENCE OF CIRCUMSTANCES AND IDEAS ON THE NATURE AND INTENSITY OF PLANNING

NEED FOR PLANNING DEPENDENT ON CIRCUMSTANCES

One of the conclusions that can be drawn from the general analysis of Chapter 2 is that the impact of planning differs between countries with different structures and that, as a consequence, the extent of the need for planning will be different too. Clearly, planning will be most desirable if its influence is felt to be favorable. Having in mind the main characteristics of planning we may expect planning to have a larger positive impact on the economy in situations where (1) there is a more pronounced need for *forecasts;* (2) there is a more pronounced need to stick to some *aims;* or (3) there is a more pronounced need for *coordination.*

The need for each of these three elements will depend on the particular structure of the country considered as well as on the circumstances prevailing. Thus, forecasts will be more necessary and more useful for activities showing wide fluctuations in either price or production, which may be due to the length of the production process or to erratic influences on production as in agriculture. Evidently countries in which these factors are of relatively great importance will be more in need of forecasts and of planning than countries where these activities do not play a large part.

The necessity to stick to certain aims more energetically than otherwise imposes itself whenever there is a wide discrepancy between reality and aims. This may generally be the case in an emergency. Countries facing emergencies—war, natural disasters, or extreme suffering for other reasons, e.g. a very low level of income—will therefore need plans more than in other circumstances.

Finally, the need for a high degree of coordination will be obvious if the number of means of economic policy utilized is large. This condition, again, differs between countries and between situations in the same country. Generally speaking the communist countries, which favor interfering in a detailed way with economic activity, will have more need for coordination than will countries adhering to a policy of laissez-faire; countries in emergency situations may also find it necessary to use more means of economic policy and hence will be in need of more coordination. We are going to take up each of these cases in more detail.

NEED FOR FORECASTS

As already stated, forecasts will be more needed in activities showing particular characteristics and in countries where these activities are relatively important. The characteristics include all factors making for wide fluctuations in volumes and prices. There are mainly three such factors.

The first is a *long-lasting production process,* implying that the time between the decision to produce and the moment the product becomes available is long, with a correspondingly greater chance of making erroneous decisions. Extended periods of production are found in agriculture and in building, both taken in the widest sense. Most of the common crops take from several months up to almost a year to grow. Coffee plants and rubber trees require some seven years before bearing fruit. Animals also usually require years to grow before contributing to the food supply. Building of houses often takes half a year; the construction of large factories or offices, or of dams and mining facilities may take several years. Shipbuilding often shows a production period of about a year. In machine building several months are required for larger units.

The second factor is *erratic changes* in production, mostly due to weather conditions and other natural forces. This is typical again for many crops as well as for fishing.

The third factor making for instability of markets is the *longevity of products.* The price of the services rendered by durable products depends not on the annual production but on the stock of these products; thus freight rates for shipping services depend on the tonnage of ships available, and housing rents on the stock of dwellings. Minor changes in demand may therefore severely affect the volume of production needed, since new production is only an addition to, not replacement for the stock already available.

Several of the markets mentioned are affected by more than one of the factors just enumerated, which makes them even more susceptible to fluctuations. The need for forecasts and plans is considerably larger in the sectors indicated than in other sectors. This means that planning will be particularly useful in agriculture, fishing, building, and the metal industries and consequently in countries where these sectors play a significant role.

In addition to those mentioned, one sector not usually considered part of the production process in the narrower economic sense should be discussed—namely education. Here again we are confronted with a long-lasting process and a long-living product, both surpassing most of the time periods valid for the purely economic examples discussed. There is a very strong argument therefore in favor of the application of forecasts and plans in the group of activities comprising education.

IMPORTANCE OF AIMS

We have stated already that aims carry particular weight in an emergency, when the disparity between reality and plans is broad and the necessity to be aware of it is strong. The two typical examples are war and underdevelopment. In a sense, an underdeveloped country which has become aware of its bad situation will feel as if it is at war, the war against poverty and destitution.

A war economy is confronted with the problem of devoting as large a part of its productive resources as possible to the purpose of winning the war. This means that the "spots" in the economy where surplus consumption or investment occur have to be traced. The reorientation of production needed for this aim has to be carried out with considerable precision since the alternatives are either to liberate too few productive forces or to cause social trouble if some vital minima are not guaranteed. It is the growing tension between aims and the tendencies of the free economy which makes it necessary to use planning procedures to an increasing extent. Accordingly war economies are usually moving in the direction of more and more planning.

In a situation of underdevelopment a similar problem arises. All surplus consumption and investment must now be mobilized in order to foster development. Again, considerable precision will be necessary in order not to delay development on the one hand and to maintain some minimum acceptable consumption on the other hand. The tension between aims and the tendencies of free production will be felt the more intensively the stronger the wish to develop. In communist countries this wish has been particularly strong because of the feeling that they were involved in severe competition with capitalist economies or even in a struggle for their political life. In the other developing countries the desire to advance has only recently started to become very strong and it may in the near future also lead to heavy tensions. The necessity of planning is generally felt in these nations.

As a third example we may add the situation which prevailed during the Great Depression. In the beginning, shortly after the 1929 crisis, the situation was not immediately perceived as an emergency. As the decline in production continued and began to surpass what had been empirically observed, with unemployment in industrial countries rising to about 30 per cent of the labor force, the feeling of being in an emergency increased. Step by step the dramatic difference between reality and what should be an aim for any decent society became clearer, and the corresponding need for planned measures of an anticyclical nature became a living issue. It took some time for this need to be recognized by governments and parliaments because of the prevailing doctrinaire approach, which held that the free forces of the economy would remedy the emergency.

NECESSITY OF COORDINATION

The larger the number of instruments of economic policy applied, the stronger the necessity will be to coordinate their use. The alternative is the development of contradictory action by the various agencies involved. A large number of instruments may be applied either because the situation requires them or because of a preconceived preference for such a policy. The situation requires the use of many instruments if the tension between aims and reality is strong; we have already discussed this situation. Thus, war circumstances as well as a state of extreme poverty, whether in an underdeveloped country or in a deep depression, require more coordination of measures of economic policy than do more normal circumstances.

There may be a stronger necessity for coordination in larger countries than in smaller, just as there is such a necessity in larger enterprises as compared to smaller. It may even be that a more highly developed country—since it constitutes a larger country in the sense of having a larger production than a less developed country—will also require more coordination. A counteracting factor seems to be, however, that parallel with higher development private initiative also becomes stronger and more can be left to the private sector than in a less developed country. Many of the forces at work have not yet been fully explored and intensive research activities are going on in the field we cover in this chapter. Our conclusions can only be tentative and provisional.

Preferences concerning the number of instruments of economic policy to be used differ according to the theories adhered to by different schools of economic thought. Economists and politicians deeply impressed by the automatic forces of a free economy will prefer the use of a small number of instruments. The theories they adhere to are of an approximative character only and later theories have been developed on the basis of exceptions which have been experienced and thought through. Thus it has gradually been discovered, from practice and from further theoretical analysis, that the assumptions on which the theories of laissez-faire were based do not apply to important types of activities. More elaborate theories now make it appear logical to use an increased number of instruments of economic policy. Among those in favor of using a larger number of instruments are socialists and communists, whose preoccupation with a redistribution of income and a quicker rate of development, respectively, has led them to this preference.

POSSIBILITIES OF PLANNING

Whether or not planning will be or must be applied in a country will also depend on the possibilities there are to carry out effective planning activities. These possibilities may be termed the "supply side" as distinct from the "demand side" discussed in the preceding four sections. The possibilities depend on: (1) the *technical competence* and *integrity* of the administration; (2) the level of *literacy* and the *civic spirit* of the business community and the population at large; and (3) the availability of *data*.

Clearly the CPB as well as the agencies with which it must cooperate need a certain minimum number of technicians in order to perform the tasks described in Chapter 1. Also a minimum standard of integrity is required for the administration as a whole to insure that the general interest will prevail over group and personal interests.

Similarly the execution of a planned policy does require the cooperation, at different levels, of the business community and the population at large. With insufficient understanding of the government's policy even the best policy may not succeed. Even in highly developed countries it may well happen that, for instance, an anticyclical policy fails because private investors "go on strike." Finally, the activities described in Chapter 1 require a considerable quantity of statistics and other information not always available.

Deficiencies of any of the types discussed can to some extent be compensated for by foreign aid resources. This is true particularly with respect to technicians. It is true in another sense for the availability of data: in the absence of data on the country concerned the planners may use international comparisons from which to estimate figures for the country in question.

Training and *education* are other means of achieving the required qualities of both administration and population; but these processes often take a long time. This is particularly true when large numbers of people have to be educated, since there will always be a section of inert and less intelligent people.

All the aspects discussed are relative in that, with only part of the conditions met, a planned policy does not necessarily become impossible but will be of lower quality than is desirable.

DIFFERENCES IN THE DEGREE OF PLANNING

We may sum up the consequences of our analysis by an attempt to indicate in what countries and under what conditions there are reasons to expect a relatively high degree of planning activity. We have explained that the advantages to be expected from planning are more visible if a number of characteristics, discussed in the preceding sections, are operating. It will be clear that several of these characteristics apply to *developing countries* which have become anxious to accelerate their growth. They usually have an important sector of unstable markets (agriculture, building, education), they feel a considerable tension between reality and aims, and they need coordination among the relatively large number of instruments of economic policy to be used.

Developed countries in normal circumstances have fewer reasons to apply planning intensively. However, anticyclical policies, income redistribution, and education are among the areas that they might judge amenable to planning; and they do have agricultural production also, if to a lesser extent. Under circumstances of war or natural disaster as well as under the threat of a deep depression they will inevitably intensify their planning activities.

Between countries otherwise in the same situation there will be differences resulting from preferences for a more or a less complicated economic policy. Countries with a strong socialist influence are in favor of more planning and countries with a dominant capitalist or conservative influence are likely to favor less planning.

In the *international community* we observe increasing consciousness of the need for supranational authorities and a clearly formulated policy. As a consequence of this process a stronger need for planning at the international level will also be felt. An attempt to formulate aims will certainly reveal a formidable tension between any set of reasonable aims for an international community and reality.

TODAY'S MOST SERIOUS CONTROVERSY

The controversy between communist and noncommunist countries is the most dangerous controversy today, since the protagonists represent the two most powerful poles of armament. The controversy is a complex one and usually stated in different terms by the two opposed parties.

The West considers the most important aspect to be the political system, that is, in Western terms, the conflict between parliamentary democracy and totalitarianism. The East formulates as the most important aspect the *socioeconomic* system; it considers itself to be socialist and the others capitalist. Intimately connected with this contrast is the degree of planning applied. The controversy also encompasses other elements normally present in international controversies.

It is not within the scope of this study to deal with the conflict as a whole. In view of its importance an analysis of the nature of the controversy on policy and planning is worthwhile, however, and fits perfectly within the framework of this book. More precisely, it is important to find out to what extent the disagreements on economic policy and planning are due to differences in the nature of the countries concerned, to what extent to differences in preconceived ideas or doctrines, and to what extent they fall within the realm of differences in scientific approach, which are open to objective discussion.

No doubt part of the difference in emphasis on state interference and the corresponding variations in the extent of planning advocated are due to dissimilar circumstances. We have already discussed the impact of circumstances on the degree of planning. Even the most developed communist countries are less developed than most Western countries, although the difference is quickly diminishing. Most Western economists and governments today agree that there is more scope for state activity and planning in developing than in developed countries. It may even be added, although this falls outside our subject, that political democracy in the Western sense can be more easily applied in a developed than in a developing country.

Preconceived ideas do play a considerable role in the controversy. These refer, in the economist's language, to two elements. Some of them reflect different attitudes toward social welfare functions in the minds of Western and communist rulers. Other elements can only be called doctrinaire in that they are based on, scientifically speaking, unjustified simplifications and generalizations of economic theories.

There remain differences of opinion which can be considered normal in regard to any subject as long as sufficient data or analysis or both are not available; as already stated, these are open to objective discussion.

DOCTRINAIRE VIEWS

We are going to discuss doctrinaire views first. They are rather common in political thinking. Partly this springs from the necessity to use simplified models in discussions in which large sections of public opinion are involved. For the same reason the models used are lagging far behind the development of scientific thinking.

Doctrinaire thinking may do considerable damage. First, it may sharpen differences in outlook unnecessarily. Next, when applied to reality it may cause trouble in the economy. In fact, it is not in the interest of any policy maker if his ideas are out of step with reality: in order to reach his aims he will take the wrong measures or he will take measures in the wrong order of magnitude. It is obviously in the interest of the authorities actually in charge of economic policy to know reality as accurately as possible.

Typical examples of doctrinaire views on economic relationships can be found at both ends of the political arena. The theories of the Manchester school are as one-sided as are Marxian theories. In more modern terms, it is as wrong to assume that external economies and increasing returns do not exist as to assume that all individual decisions of producers and consumers have to be controlled by central authorities. We may also speak of doctrinaire views on economic policy when national autonomy is always given preference over international decisions.

While the examples so far quoted refer to broad principles of economic policy adhered to by some political parties or some governments, there are also illustrations of a more restricted character. Examples in the communist world are the preference for the "most advanced" technology, and for heavy industry, or their way of handling the cost of capital as a production factor. Examples in the Western world are the preference for monetary policies, the preference—within this field—for fixed rates of exchange, or the preference for a "free" wage policy.

DIFFERENCES IN SOCIAL WELFARE FUNCTION

Some of the controversies between communist policies and Western policies may be expressed in terms of the weight given to the interests of the various social groups constituting society and to the components of well-being. No very precise statements can be made and the distance between slogans and reality must be kept in mind. The simple slogans are that communist regimes are interested in the well-being of those who work and not of those who own the means of production, whereas Western regimes are interested in the well-being of all citizens. The comparative weights given to the various groups of workers in communist countries and to the segments of the population in Western countries are difficult to ascertain. Some economists even deny the possibility of defining them. With respect to the claim that Western society gives equal weight to all, since everybody has the same voting rights, it should be borne in mind that there is a difference in outlook between the people and the members of the national legislature and that there are many informal influences making for a concentration of decisions in relatively few hands. The weights given to the interests of different citizens still tend to be higher for higher incomes. The same is true for the weights given to the interests of different countries.[1]

An example of the difference in priorities given to the elements of well-being is the weight attached to various types of freedom. Some Western countries or groups inside these countries reject some types of intervention because of an a priori very high weight assigned to consumer sovereignty.

Two tendencies will help, however, to diminish the divergence in social welfare functions which is basic to the policies of the two opposing groups of countries. On the one hand, the situation in the communist countries tends to make every citizen an active participant in the production process and hence to wipe out the difference between the working population and the total population. On the other hand, tax systems and systems of social insurance, as well as education, make for an ever increasing equality among the groups of the population in Western countries, and for a decreasing weight given to the interests of the owners of the means of production in large enterprises. The owners of the means of production in small enterprises are practically always workers as

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1. This may be illustrated by the theory of international trade. The equations for the exchange of goods between countries under a regime of balance of payments equilibrium on current account can be derived from the maximization of an international utility function provided that weights given to each country's utility are inversely proportional to marginal utility for each country. Cf. H. Uzawa, "Prices of the Factors of Production in International Trade," *Econometrica,* 27 (1959), 460.

well as owners. We believe therefore that the weights given to the interests of the various groups of the population are tending to become similar in the two types of countries.

DIFFERENCES OPEN TO ARGUMENT

There remain a number of differences in outlook which need not be called doctrinaire or do not find their origin in opposing social welfare concepts, but can be analyzed with the help of *objective* data and arguments. Their role seems to be an expanding one, partly as a consequence of new developments in theory and in policies on both sides of the iron curtain. Both East and West have changed considerably. Communist regimes have adjusted to a series of new experiences in production, policies, and theoretical discussions. In the Soviet Union, wage systems have been changed, cost calculations and consequent views on international trade as well as on investment priorities have been altered, the organization of planning has changed, and the price and incentive systems in agriculture are in continual development. In the developed countries of the West the application of planning devices has spread enormously, it has become generally accepted that unstable markets need permanent regulation, and education is increasingly being made available to the lower-income groups of the population.

Economic systems and economic thinking are becoming less different in these two major areas of the world. Gradually a number of problems are becoming objects of scientific or practical argument between the technicians on both sides. The appraisal of investments and the choice of technology, methods of planning interrelated industrial outputs, methods of estimating consumer demand, methods of stimulating productivity, methods of education and of selection of students are examples of problems that have entered this phase. It may soon become possible to discuss whether price fixation and the degree of freedom to be given to factory management or farmers are optimal or not in the two competing systems. It may also become a debatable issue whether private ownership of means of production in small-scale enterprises is not more efficient than state ownership. Both sides may continue to learn from experience and from each other. We must encourage this approach and try to make contributions. Our next chapter may be seen as an attempt to do so.

4 OPTIMAL PLANNING

THE UNKNOWNS OF THE PROBLEM

This last chapter will be devoted to indicating the "best" way of planning for economic policy. We have described in Chapter 1 the economic activity called central or government planning and indicated some alternative techniques to produce the same—or almost the same—product. In ordinary economic activity the question which necessarily follows is how to choose among the various alternatives in order to find the best technique under the circumstances in which the process has to be carried out. The standard answer of the economist is that the technique must be chosen which maximizes profits or the contribution to national product. For our purpose we must not take this advice too literally; we must also look for the choice which maximizes the result to be obtained in comparison to the means used.

The problem of optimal planning, however, because of its close links with the economic regime and the policy to be planned can be posed in a wider and a narrower sense, which must first be clarified. In the wider sense the question to be put is what is the optimum regime for a given country; in the narrower sense we take the regime for granted and ask how, for this given regime, planning can best be carried out. Both questions, moreover, can be put for a national economy as well as for the international economy.

As a first step on the road to a solution—which we think is not yet available—we may specify somewhat more explicitly what, in the logical sense, are the *unknowns* of each problem. An economic regime is characterized by a number of institutions (each with their tasks, activities, procedures, and methods); they actually represent the unknowns of the problem of the optimum regime. Examples of such institutions are private or public enterprises, tax systems, markets, and unions. Their activities depend on a continual number of decisions regarding production, consumption, pricing, taxing, and so on. In the optimum regime the joint decisions must be such that a maximum of well-being for the community is obtained. The way in which the decisions are taken depends on the setup of the institutions: a private enterprise tries to maximize its profits, an individual household to maximize its satisfaction, both of them under the particular conditions in which they are operating. In the optimum regime these decisions must coincide as much as possible with the decisions maximizing general well-being and this must occur as a consequence of a "clever" choice of the institutions and their tasks.

Also a planning system is characterized by a number of institutions, with certain tasks, activities, procedures, and methods, which are part of the institutions in the economy as a whole. In the wider setting of the problem of optimality we want to know how all institutions, including those of planning, must be chosen. In the narrower setting of the problem we want to know only how to choose the planning institutions, considering the others as given already. Clearly, in the latter case the planning institutions depend on the regime, and are determined by its aims and means. In a liberalist regime very little planning will be needed; in a communist system a good deal of it is necessary. We are going to specify both choices in the next few sections.

THE OPTIMUM REGIME

The problem of finding the optimum regime is the central problem of *welfare economics.* In this sector of economics we know that among the data of the problem a social welfare function is the first element. This means that we assume knowledge about two things: first, about the preferences of the individuals constituting the economy and, second, about how to weigh the interests of different individuals in determining social well-being or social welfare. In customary economic language this means, first, knowledge about the utility functions of individuals and, second, about the social utility function. These are far-reaching assumptions, because our knowledge about individual utility functions is very limited, and the social welfare function depends on how we compare utilities of different persons. For the time being this is done intuitively only and therefore leaves much room for differences of opinion. It is interesting to note that notwithstanding these uncertainties welfare economics is able to make substantial contributions to the solution of our problem.

The core of the method used by welfare economics is to formulate a number of conditions of maximum welfare and to try to interpret these conditions in terms of institutions.

The main problem concerns side conditions. What must be maximized is social utility or welfare under the side conditions of the laws of production. No other side conditions must be added, in particular no conditions of an institutional character, since the institutions are unknown. The only laws we cannot violate are the laws of nature. A well-known example of the older, Paretian, version of welfare economics is that one set of conditions which must be fulfilled in a state of maximum welfare says that the marginal utilities derived from any pair of commodities must show the same ratio for all persons. Since such a state of affairs would be forthcoming if all people bought or sold these commodities in a competitive market, the institution of the market may be used to construct an optimum regime. This example is given only to clarify what we mean by "interpreting the maximum conditions in terms of institutions." The example is correct only if several hypotheses are fulfilled which need not always apply.

Before speaking about concrete solutions of the problem of the optimum regime we must make some additional statements on the general logic of the method used in welfare economics.

To begin with, we shall have found a solution only if we can enumerate a *complete* set of institutions whose decisions together fulfill all the maximum conditions of our problem. Institutions whose activities would fulfill only some sets of maximum conditions may not be even part of a solution, if we cannot find other institutions which meet the remaining maximum conditions. The complete solution, if there is one, may not be unique; there may be other institutions also leading to the optimum. Thus, the function performed by a free market may also be performed by a set of government rules and controls.

But, on the other hand, it may also be—and it looks very much for the moment as if we are in that position—that we do not know any solution. This situation presents itself whenever we cannot find an institution which is able to satisfy one of the sets of maximum conditions. This, for the time being, is the case with the equations asking for equalization of the marginal utility of income among all consumers. This set of equations is equivalent with a type of income redistribution not met by any of our existing taxes. What is required is the so-called *lump-sum redistribution,* that is, a redistribution which does not change the marginal decisions of consumers. Income taxes, which are the most important redistribution device used at present, do not satisfy this condition.

If, then, one set of conditions of maximum welfare cannot be met by any existing institution, the institutions that satisfy the other conditions become of doubtful value too. Indeed, they may well help to violate the nonsatisfiable conditions to such an extent that they had better not be applied. What we must now try is the method of the second-best. If we do not know a set of institutions which together satisfy all the maximum conditions, we may look for a set of institutions which bring us as close to the maximum as possible. This set we cannot find by a direct "interpretation of the maximum conditions in terms of institutions"; we simply must try the solutions out. We will call this the *indirect method.* Solutions found in this way will have to be given up if better solutions are found later. Elsewhere the author has tried to give an example of the indirect method, where the income tax appears as such a "second-best" solution.[1]

One aspect of the solution concerns the degree of decentralization in decision-making which is compatible with the maximum conditions. The free market with free individual enterprises offers the well-known example of a complete decentralization of production decisions, which is compatible with maximum conditions if the laws of production show decreasing or constant returns and no external effects. But there are also activities for which these production laws do not apply, and where complete decentralization may not be permitted. This is true typically for activities having "external effects" as well as for activities with increasing returns.

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[1] J. Tinbergen, "Should the Income Tax Be among the Means of Economic Policy?" *Festskrift til Frederik Zeuthen* (Copenhagen, 1958), p. 351.

Our knowledge is insufficient to solve the problem of the optimum regime, except in oversimplified cases such as the Pareto case where no external effects and no increasing returns are assumed and where it is assumed tacitly that a lump-sum redistribution can be made. Yet we may sketch, on intuitive grounds, the probable structure of a solution, as a first crude approximation. Some of the general remarks made before about the non-uniqueness of the possible solutions and the second-best character of some institutions must be kept in mind, however.

For several reasons there is a need for an institution of the nature of the state where a number of decisions must be taken which cannot be decentralized because of their external effects or increasing returns. Measures dealing with safety, the maintenance of law and order, the stability of money value, the operation of roads, education, information, planning, and taxation must be controlled by such an institution. Some of these activities may even have to be centralized above the national level; others can be decentralized geographically and put into the hands of local authorities. Even some forms of production or distribution of commodities, such as energy, water, and steel, may be converted to public enterprises because of their external effects and because of increasing returns. Since increasing returns make price formation unstable, alternatively tending to either excessive competition or monopolization, their decentralized (private) operation meets with difficulties. For what have been called unstable markets in Chapter 3, government regulation may also be preferable.

The tax system must facilitate redistribution so as to equalize marginal utilities; taxes on wealth and income must therefore have high priority. It must also be conducive to a budget surplus, since the savings rate of the economy has important external effects and hence cannot be left to decentralized (private) decisions.

The remaining very numerous decisions on production and consumption can be made in a decentralized way, that is, by private production and consumption units (enterprises and families). These decisions will be influenced only in an indirect way by government (or lower public authorities') actions, such as those affecting investments made in the public sector, educational and information facilities, and tax policies. In designing their program public authorities will have to take into account, as much as possible, the reactions likely to be induced in the private sector by their own decisions. One may express this state of affairs by saying that what has to be done by the public sector is not to create alone a balanced process of development, but rather to induce in the private sector the most desirable reactions so that together they will achieve the optimal total process. This may imply, as Hirschman[2] likes to put it, that the public sector purposely creates "unbalances" in order to evoke the most desirable process of development. I do not think, however, that "unbalanced" is a very helpful term; in fact the category of unbalanced patterns implies a large number of patterns which do not evoke the proper reactions, and what Hirschman is after is only some very specific subcategory, which it would be better to define more specifically.

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[2] Cf. Albert O. Hirschman, *The Strategy of Economic Development* (New Haven, Yale University Press, 1958).

Large subcategories of the category of unbalanced patterns are highly undesirable.

While the preceding description of what might be an optimum regime has stressed the structure, such a regime also has a rate of development over time which must satisfy the optimum conditions of welfare economics. The question of the *optimum rate of growth* is a difficult one on which, only recently, remarkable light has been thrown by a number of rather complicated scientific analyses.[3] At present the optimum rate of growth for low-income countries cannot be based on the knowledge so far accumulated. For developed countries the point of view may be defended that a development of some 7 per cent per annum constitutes a maximum; higher rates will be suboptimal.

Clearly the choice of the degree of "tautness" of planning (cf. Chapter 1, page 12) will have to depend on the results of the analysis of what an optimum rate of growth should be.

OPTIMUM PLANNING: CHOICES TO BE MADE

As was already observed, the "best" way of planning economic policy will to a considerable extent depend on the regime. Planning, in a way, is a set of decisions on economic variables, such as production, prices, and incomes, and in a way a "general rehearsal" of real economic life. Therefore it must have a similar structure to that of the actual economy. The correspondence need not be complete, however. It is clear from our preceding discussion that there are several degrees of freedom for the planning process.

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[3] Cf. G. Bombach and C. Chr. v. Weizsäcker, "Optimales Wachstum und Gleichgewichtswachstum," in *Optimales Wachstum und optimale Standortverteilung, Schriften des Vereins für Sozialpolitik* (Berlin, 1962); S. Chakravarty, "Optimal Savings with Finite Planning Horizon," *International Economic Review, 3* (1962), 338; L. M. Koyck and M. J. 't Hooft-Welvaars, *Economic Growth, Marginal Productivity of Capital and the Rate of Interest* (International Economic Association, Royaumont Conference, 1962).

In this section we will set out some of the major choices to be made in order to define, and hence to select, a planning process. We will deal successively with the task, the method and activities, the organization, the procedure, and the timing of the process.

As to the task of the planning institutions, the most important question is, *what* has to be planned. Should all production figures of hundreds or even thousands of branches be planned; should all big single projects be planned; or should only a few industry groups, maybe only the public sector and the unstable markets be planned; or, as an extreme minimum, only some major instruments of economic policy?

With regard to the methods and activities of planning, one of the most important questions is whether the various unknowns of the planning problem—all the figures—should be determined *simultaneously* or whether there is scope for a certain decomposition of the process into *stages* or phases (cf. Chapter 1, pages 26–27).

As an example of planning in stages we may give, as a basis for discussion, a rather precise list of activities to be carried out in succession:

I. The Macro-Stage

1. Instruction of planning bureau by government on aims and means of policy
2. Collection of statistics and forecasts on "data"
3. Macro-forecast
4. Confrontation with aims
5. Macro-plan

II. The Sector (and/or Regional) Stage

1. Collection of estimates on income elasticities

2. Sector plan, or regional plan, or both

III. The Project Stage

1. Issue of directives to "cells," request for projects
2. Project appraisal by sector authorities
3. Project appraisal by center
4. Revised sector-cum-region plan
5. Consultation with sectors
6. Consultation with regions
7. Changes
8. Submission to government

IV. Final Stage

1. Possible changes; adoption by government
2. Publication
3. Adoption by parliament

Numerous variations on this example are conceivable. Thus, if certain well-defined regional targets are set, regional planning of a macro-character may be made also in the macro-phase. If no such targets are set, regional plans may only become available after the selection of projects. Some of the initial phases may have to be repeated if it is found in later phases that some of the coefficients used in the early phases can now be estimated more precisely—e.g. the capital-output ratio, after the composition of production has been fixed.

The question of *organization* concerns the number of institutions needed—must there be sector and regional planning bureaus—and the hierarchy within the planning bureau.

With regard to *procedure,* there is considerable freedom even with a given method of planning. Contacts with the outside world may be more or less numerous, depending on how the elements involved are dealt with. These are, as was noted before: (a) the element of information, and (b) the element of democracy. The procedure with regard to the first element depends on the type of information needed and the way of obtaining it. With respect to the democracy factor it depends on who is to be consulted, what variables he is going to be consulted about, what influence is given to him, and what procedures of discussion are going to be used in such consultations.

The *timing* problem does not exist to any great extent for short-term planning, since there is little choice as to timing; there is more freedom in long-term planning.

CRITERIA FOR OPTIMUM PLANNING

The choice of the process among the many alternatives presented must, in principle, be made according to a number of criteria, which indicate the bases of appraisal to be applied. Among these the following may be stressed:

(1) An important criterion is the degree of *accuracy* obtainable, taken in the wider sense of being geared to the needs of the economy under the given circumstances. This means not only that the estimates must be as precise as possible, but also that the proper variables must be included in the set of estimates, having in mind the aims and means of economic policy.

(2) A second criterion must be the *time* needed for the operation; because of the usually short period available, especially for the preparation of short-term plans, economizing on time is an important aspect of the economics of planning.

(3) Other costs involved generally are all sacrifices to be made except time sacrifices; usually the latter will not be expressed in money. In a somewhat more general way, costs stand not only for efforts made by all officially concerned, but also for disutility springing from frictions, irritation, and so on. Obviously it will be possible to keep costs down by

trying to minimize the number of elementary operations involved.

(4) A final criterion may be the *degree of democracy* allowed in the sense of satisfying justified desires of interested groups to have an opportunity of giving an opinion, or even participating in a number of decisions about the plan.

In order to apply the criteria most effectively, their relative importance should also be known. It will be evident that we are still far from having sufficient information to apply the criteria in a scientifically accurate way; to a considerable extent the choice must be made on intuitive grounds. For the same reason it is not possible yet to make even the most tentative statement with regard to the degree to which actual plans today satisfy the conditions formulated.

SOME REMARKS ON OPTIMUM METHODS: WHAT MUST BE PLANNED?

The problem of finding the "best" way of government planning has not yet been solved nor will its solution be possible in the near future. At best, a number of suggestions can be made to help in finding the solution in the future. The discussions about planning are becoming more objective and are among the "living issues" of economic science. In a general way it may be said that there is a correspondence between the problems of the best regime and the best method of planning, as has already been observed. Both are connected with the mathematical or logical structure of the relations describing the economic mechanism, and some suggestions can be derived from that structure.

We will take up some of the main questions posed in pages 88–90, asking first what has to be planned. The answer is, in principle, all the decisions which it is proper for the government to take—as distinct from decisions which can be taken at the more decentralized levels, that is, by producers and consumers individually or in groups. We have already stated that welfare economics teaches us that some activities show characteristics which make them amenable to more centralized decisions; among these are economic actions having marked external effects and activities leading to increasing returns. They concern such traditional government tasks as preserving internal order and external safety, the operation of roads, support of education, maintenance of a sound monetary system and, more recently, the handling of a tax system aimed at a redistribution of incomes and an even development of the economy.

The last few items are more typically the instruments of a macroeconomic policy, used to attain short-term targets that are part of an anticyclical adjustment to outside disturbances. In this category there is a need for at least one instrument influencing the *volume* of operation of the economy and one influencing the *price* level. The former may be the total amount of expenditures minus taxes, or the "inflationary or deflationary gap" of public finance. The latter instrument may be either price and wage controls or flexible exchange rates. In addition to the general instruments to be used for short-term economic policy there may be some more specific ones, applying to single unstable markets.

Some of the instruments mentioned may also be employed for long-term purposes. Public finance, and more particularly public investments, can be used to influence the rhythm of development. In this realm the decision on the total amount of savings of the nation to be aimed at must be mentioned because this too is a decision with noticeable external effects.

Decisions concerning activities that show increasing returns include, in principle, decisions on the production of energy and transportation as well as on some heavy metal and chemical industries, often operated by the public sector.

One of the reasons why such decisions may better be centralized is the danger that too small units and too many of them would otherwise be created. For the developing continents it is preferable that the establishment of such units be controlled by public authorities.

All or most of the decisions summed up under the two headings of external effects and increasing returns should be planned, because of their impact on the well-being of others than those carrying them out. For the same reason it is not immaterial at what level—the national, or a higher or lower level—they are planned. Several of them should be subjects for some form of *international* planning. In the present situation of carefully guarded national autonomy this will often be done only in the form of loosely coordinated national decisions. For optimal results in the future some main decisions should be centralized at the international level.

There remain many decisions satisfying more or less the hypotheses of the old welfare economics: absence of external effects and of increasing returns. They are the production decisions in agriculture, retail trade, and the "light" industries—which can be made with more accuracy the smaller the optimum units of such industries are—and the consumption decisions of families relative to their disposable income. These decisions need not be planned by the government, even though they may be facilitated by broader information such as is provided by market analyses. Hence planning may imply an estimate of the total demand for a number of categories of goods in these sectors.

SOME REMARKS ON OPTIMUM METHODS: PLANNING IN STAGES?

The next major question about optimum planning methods concerns the topic of planning in stages. Under what conditions, we may ask, is it efficient to carry out the complicated process of estimation of the plan figures in several successive stages, as outlined in pages 88–89. Formally the situation is this. The mathematical structure of the set of equations describing the economic mechanism may show one of three characteristics.

1. The matrix of its coefficients may permit the *ordering* described by Herbert A. Simon;[4] then, the planning process is one of stages.
2. The matrix may be *close* to such a structure; then the planning figures can be approximated in a number of stages.
3. The matrix may *not* be close to the structure needed for ordering; then a simultaneous solution is necessary.

Elsewhere the author has tried to give some arguments why, in several types of circumstances, planning in stages is possible and desirable.[5]

A separate execution of what was called the macro-stage was argued on the following grounds:

1. The decision to be made is one of great importance and must be fully covered by the government; hence it is desirable to formulate it in such simple terms as are possible in the macro-stage.
2. For lack of some fundamental data this decision cannot yet be based on any precise calculations; it must be partly based on intuitive considerations, which it seems better to isolate from the following stages.
3. If an erroneous value for the capital-output ratio

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[4] Herbert A. Simon, "Causal Ordering and Identifiability," in *Studies in Econometric Method,* ed. W. C. Hood and T. C. Koopmans (New York and London, 1953), p. 49.

[5] J. Tinbergen, "Planning in Stages," *Statsøkonomisk Tidsskrift,* No. 1 (1962), pp. 1–20.

is taken, this error can be easily corrected afterwards, since a strongly converging series of successive approximations can be made.

There are also good reasons to make a distinction between a *sector* stage and a *project* stage, as suggested above (pages 88–89). In the sector stage figures on the national sectors as defined earlier (see pages 9–12) can already be estimated almost independently of the choice to be made with regard to the international sectors. In somewhat different terms this means that the infrastructure investments (which coincide to a large extent with those in the national sectors) can be planned with sufficient accuracy in an earlier stage. The same argument applies to regional sectors in regional planning. In a general way this method has the advantage that decisions on the infrastructure can be taken before coordination at the higher geographical level on the international sectors is finished.[6]

Apart from the two major questions of method which have been briefly discussed (what to plan, and whether planning in stages is possible) there are a number of relatively less important methodological questions to be solved in order to define an optimum method. Some of them are mentioned below.

(1) The forecasts of data can be made in different ways. For some of the most important data in short-term planning *direct inquiries* may be the best method. A good example is the forecast of planned private investment during the next calendar year. It is safer and simpler to ask several large enterprises than to try to forecast their plans from some econometric relationship. The method of direct inquiries will be less reliable where the actual decisions have not yet been

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[6] J. Tinbergen, "De optimale organisatie der economische beslissingen," Kon. Ned. Akademie van Wet., *Mededelingen,* Nieuwe Reeks, Deel 24, No. 7 (Amsterdam, 1961).

taken, as in longer-term forecasts. Statistical practice has developed methods, ranging from least to highly sophisticated, of extrapolation of data. Among the simpler are the linear extrapolation of past movements over shorter or longer periods. Nonlinear extrapolation can sometimes be better depending on what the underlying theory is on the phenomenon to be extrapolated. Extrapolation on the basis of relationships with other phenomena is the next best method, available in a considerable variety, from one relationship to many. Thus demand for an export commodity may be based on an extrapolation of incomes abroad, which may or may not be calculated with the aid of an econometric model for the countries considered.

(2) This brings us to the subject of *estimating relationships*. The development of econometrics has produced here also a wide range of methods, starting with hand-drawn relationships derived from scatter diagrams, up to simultaneous maximum-likelihood estimates or two-or-three-stage least squares estimates of sets of relationships. There are some interesting examples where the coefficients found for some elasticities or propensities, with the aid of the more sophisticated methods, are significantly different from the figures found in more primitive ways, and here the former must be preferred. There is also, however, a danger that some econometricians may indulge in complicated methods instead of trying to obtain better statistical and other information on the forces at work. Much intuitive judgment and wisdom is needed to make the best use of a country's scarce manpower in these fields.

(3) There are also numerous methods of *appraising investment projects*. This activity will necessarily play a large part in the long-term planning of developing countries, but it may be very useful for developed countries too. A series of alternative criteria have been proposed, some of them

fitted to one situation and others better fitted to different situations. Before dealing with them we may say something about the objects to which they should be applied. Probably the most useful is a set of projects including one to produce international goods, together with all the necessary complementary sets producing national goods (energy, transportation, building, retail trade, education). In this way it is not necessary to deal with the latter separately, with all the difficulties of appraising services which do not have prices. Alternatively we may leave out of the complementary set just mentioned some types of national commodities of a very general character, which it is difficult to allocate to the ultimate users, such as general education, general administration, and security.

The criterion used should in principle be a fraction whose numerator indicates the contribution of the object to the aims of national policy and the denominator the costs of the investment, that is, of the scarce factors used. The simplest example assumes one aim only—say, to raise national product, and one scarce factor only—say, capital. In that case the criterion is the *output-capital ratio,* i.e. the inverse of the capital-output ratio or the recoupment period. More complicated policies may have the further aims of improving the balance of payments, of helping underdeveloped regions or low-income classes first, and so on. These aims must then also be represented, with a certain price, in the numerator of the criterion fraction. There may also be other scarce factors, e.g. qualified labor, to be taken account of in the denominator.

SOME REMARKS ON OPTIMUM PROCEDURES

Planning procedures must also be chosen and, as already stated, they serve two main purposes: to obtain better information and to serve democracy by involving as many interested groups as possible. The instrument of outside contacts is, as a rule, the *meeting,* although there are simpler methods such as the letter or the telephone conversation.

Meetings serving primarily the purpose of informing the planners may take one of two main forms. We first have the meeting where outsiders supply factual and numerical information, which in principle must be statistical data, including coefficients, e.g. the supply elasticity of agriculture. This type of information can best be supplied by experts of the sector concerned, agriculture in our example; but these experts may be interested parties, which creates a problem as to the reliability of the information. The contacts between sector experts and general (or central) experts in planning also create an interesting problem as to the proper questions to be asked of the sector experts. The data solicited should in fact be information about the coefficients rather than about the variables; in our example, the supply elasticity rather than the quantity to be supplied. The latter, being an unknown of the planning problem, should properly be found by the solution of a number of simultaneous equations, which is the task of the central planner. In other words, the sector expert should not be allowed to decide on the production figure, because that depends on other coefficients —the price level, the income level, and so on—on which he is not an expert.

The second type of meeting for information purposes is one where the central planners discuss with other experts the uncertain elements in the relations they use and the methods they apply. This is more like a *scientific* discussion, an exchange of views, and is very often necessary in a new field like planning.

While the element of democracy is already present in the types of information meetings just discussed, the most typical form of meeting serving democratic purposes is the *distributive meeting,* where the distribution of something—say, the building volume—over a number of interested groups—say, the ministries—is discussed and maybe even decided upon. This meeting tries to solve a number of equations—e.g. those representing the condition of equal marginal utility of various uses made of one product, in our example buildings. The meeting does this as an alternative to what the central planning office could do itself using, perhaps, the method of project appraisal.

There may be particular reasons for preferring such a meeting to a calculation by the center. The most important one is that, in a hidden way or more openly, a comparison of the utilities of different groups of the population is involved—the central problem of the structure of the social welfare or utility function discussed earlier (pages 82–87). In such a situation the equalization of marginal utilities cannot be done simply by the decisions of one person or firm, as in the case of that person's consumption pattern or that firm's use of raw materials for manufacturing purposes. Perhaps the clearest and most important example of the distributive meeting is the meeting of parliament in which the income tax rates are determined. Distributive meetings are also valuable when a product must be allocated for which no price is charged, such as education or the use of roads.

Even though there are still large unsolved problems, some rules for the optimum procedure of distributive meetings may be formulated:

(1) If democracy is to be served, all interests involved must be represented; otherwise decisions will tend to be to the disadvantage of those absent. For distribution problems in which many units are involved, it may, however, be efficient to make decisions in *stages* again: the distribution among large groups—farmers, workers, independent urban pro-

ducers—may first be discussed by representatives of those groups, leaving discussion of the distribution between *types* of farmers, workers, etc. until a later stage. For the first decision not all types of farmers need to be represented, since their interests at that stage are parallel. At the later stage they are more likely to diverge.

(2) The meeting must have as its task to discuss one or more "unknowns" in the system of equations. This may imply a rule for the composition as well as the agenda of the meeting. In the sphere of macroeconomic policy, that is, of interdepartmental committees, the meeting should deal with an instrument rather than with a target of policy. In other words, a committee on taxes or on wages makes sense; one dealing with the balance of payments or employment does not make sense. Decisions on taxes must be made in light of the desired balance of payments and level of employment; and each of these also has to be considered when wage policy is at stake.

(3) The meeting must always have before it a *proposal,* prepared by the center, satisfying the side conditions to be met, e.g. a building program that adds up to needed building capacity. Discussants may amend the proposal, but they cannot be asked to produce the proposal.

(4) Amendments admitted for discussion must also satisfy the side conditions: an amendment to raise one party's portion without indicating at whose expense is not feasible and to discuss it is a waste of time. Discussions not aiming at an amendment must be avoided.

Our remarks about the optimum procedure may be concluded by a suggestion for arriving at an optimum along lines familiar to the economist. Starting out with a method, activities, and procedures which may have grown historically or been chosen intuitively, small changes may be considered and appraised in the light of the criteria discussed in pages

90–91. Some changes will turn out to be valuable and leave a positive balance; others will not. One may hope to arrive at the optimum in this way, but there is no complete guarantee, of course.

Our discussion of the optimum process of planning applies not only to national planning operations, but to international activities as well. Thus, the rule that in a distributive meeting all interests should be represented has far-reaching international implications. Some of the most vital decisions in the financial sphere are made today at the national level. We must accustom ourselves to the idea that they should, according to our rule, be made in international gatherings. We do understand this already for decisions on commodity agreements and trade policy; we do not yet recognize it in the financial field. Policy as well as planning in the international community should be carried out partly by a set of appropriate international—or rather supranational—organs.[7]

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[7] Cf. J. Tinbergen, *Shaping the World Economy* (New York, 1962).

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